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## **APPENDIX R**

### **Federal Lands Review**

- R-1. Visual Quality Assessments for the Pacific Connector Gas Pipeline on the Rogue River and Winema National Forests**
  - R-2. Analysis of Potential Impacts to Wilderness, Inventoried Roadless Areas, Potential Wilderness Areas and Other Undeveloped Areas from the Construction and Operation of the Proposed PCGP Project, Umpqua, Rogue River, and Winema National Forests**
  - R-3. Winter Range Standard and Guideline Compliance, Rogue River National Forest**
  - R-4. Connectivity and Diversity Block Assessment, Coos Bay and Roseburg District BLM**
  - R-5. Analysis of Bureau of Land Management Areas with Wilderness Characteristics**
  - R-6. Consistency Determination, Pacific Connector Gas Pipeline Project and Upper Rock Creek Area of Critical Environmental Concern**
  - R-7. Compliance with the Requirements of the Final Supplemental Environmental Impact Statement for Management of Port-Orford Cedar in Southwest Oregon, Coos Bay, Roseburg and Medford Districts and Klamath Falls Resource Area of the Lakeview District, Bureau of Land Management**
  - R-8. Visual Resource Analysis, Coos Bay, Roseburg and Medford Districts BLM**
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  - R-10. BLM Letter to FERC regarding Project Impacts on Wild and Scenic River Resources**
  - R-11. Recreation Management Plan**
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## **Appendix R-1**

### **Visual Quality Assessments for the Pacific Connector Gas Pipeline on the Rogue River and Winema National Forests**

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# Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project

## **Final** EIS

### Appendix R-1

#### **Visual Quality Assessments for the Pacific Connector Gas Pipeline on the Rogue River and Winema National Forests**

#### **Pacific Connector Gas Pipeline Rogue River, and Winema National Forests**

Prepared for:

**USDA Forest Service**

Prepared by:

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# **PCGP Forest Service Visual Management Mitigation Analysis**

## **Pacific Connector Gas Pipeline Scenery Management Analysis and Mitigation Recommendations**

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The Pacific Connector Pipeline project traverses three National Forests along its route from Coos Bay to Klamath Falls. These Forests use the Visual Management System, (VMS) to manage the visual resources and to analyze visual effects of proposed projects. The VMS uses a rating system known as Visual Quality Objectives, (VQO) to establish standards for scenery resource management.

The Visual Management System, Handbook 462 was published in 1974. Since then, Handbook 701 updates the most current Forest Service direction for scenery management. The Landscape Aesthetics, Scenery Management System utilizes a very similar rating system as the VMS that is used to evaluate project impacts to the visual quality. In addition, an appendix has been adopted to address the stability of scenic attributes as well as the direct visual effects of a project. Appendix J utilizes a scenic stability indicator to rate the stability of scenic attributes and how a project will affect that stability. The three Forests involved in the PCGP route have not formally adopted the Scenery Management System as Forest Plan standards. However, the direction to the Forest Service has been, since 1996, to incorporate the new system as we work on new projects. This analysis will utilize the existing visual quality objectives established in the forest plans of the Rogue River-Siskiyou, Fremont-Winema and Umpqua National Forests, as well as apply the scenic stability indicator of Appendix J to address the conditions and trends that may place the scenery attributes and the proposed and recommended restoration efforts at risk.

The proponent Aesthetics Management Plan proposes restoration efforts and some minimal mitigation measures that broadly address the effects to scenery. However, where the route is in areas where the Visual Quality Objective is partial retention or retention these measures will not meet these objectives within the target time frame. This analysis has examined these areas and the proposed mitigations within the proponents Aesthetics Management Plan and shows why the proponents AMP falls short of the Forest(s) objectives for visual resources. This analysis looks at the proponents AMP, and then makes recommendations for mitigation measures recommended to improve the restoration and mitigation efforts. and determines what VQO would be met.



## **PCGP Forest Service Visual Management Mitigation Analysis**

The Pacific Connector Gas Pipeline route traverses National Forest lands in areas that have very rocky and porous soils. It is expected that restoration efforts related to revegetation may require lengthy periods of time to meet the visual quality objectives. This is particularly true on the eastern side of the Cascade Range where rainfall is significantly less, the temperatures are colder and the species selection for revegetation is more limited.

### **PCGP Aesthetics Management Plan**

(Interpretations from the Proponents Plan to Mitigate Scenic Quality Effects)

#### **Construction Effects**

The construction of this gas pipeline will require a 95 to 75 foot construction zone. This construction zone will be clear cut and leveled from one side to the other for construction safety. At the edges of this construction zone, the uncleared storage areas will be used to store equipment during construction as well as excess boulders and root wads. Temporary extra work areas will also be cleared and leveled during the construction phase of this project beyond the construction zone. The clearing of the right-of-way will create a sharp edged linear feature across a contiguously forested landscape. The excavation will expose subgrade soils that will contrast with the color of the forest canopy. It is expected that the amount of boulders and root wads will be excessive in this landscape making it difficult to dispose of in a manner that will not affect scenery. Boulders scattered on top of the ground do not appear natural and root wads with cut stumps are very distracting if found in more than occasional amounts. The compaction of soils and loss of topsoil caused by construction equipment will affect the success of proposed revegetation.

#### **Right-of-way Maintenance Effects**

A thirty foot corridor centered directly above the pipeline shall be maintained for the fifty year life of the pipeline by removing trees greater than 15 feet and vegetation greater than 6 feet in height.

Depending on the methods of clearing, the effects could be similar to road brushing which uses a thrashing technique that leaves a rough brushed appearance immediately after clearing. The 30 foot corridor, once the construction zone is revegetated and allowed to rehabilitate; will appear as a linear feature that is incongruent with natural terrain or even typical corridors such as roads that gradually climb the side hill rather than rise directly up a slope.

The construction techniques proposed by the proponent in designated visually sensitive areas are as follows:

- a. Strategically place construction debris (slash, boulders, stumps,
- b. Shape and blend the right of way to the extent practicable to conform with preconstruction contours and the characteristic landscape
- c. Rock and log barriers used to prevent passage of OHV's.

## **PCGP Forest Service Visual Management Mitigation Analysis**

- d. Utilize rock and boulder material generated during construction as trench backfill material where appropriate.
- e. Unknown storage methods to ensure enhancement and mitigation of visual resources along the right of way to the extent they are practicable and safe.
- f. Revegetate all disturbed areas and replant trees in temporary extra work areas (TEWAs) that were previously forested.
- g. Plant a row or cluster of trees and/or shrubs across the right of way to provide visual screens at key road and trail crossings in sensitive viewsheds.

### **Specific Mitigation for Key Observation Points**

#### **Big Elk Road (MP 161.41)**

- a. "Neck-down" construction zone across road from 95' to 75'
- b. Route shall cross directly perpendicular to the road
- c. Revegetate with native trees, shrubs, and plants
- d. Plant a row or cluster of trees and/or shrubs across the right of way to provide visual screens at key road and trail crossings in sensitive viewsheds.
- e. Shorten the potential visual corridor by turning the corridor on both sides of the crossing
- f. UCSA's eliminated within "necked-down" zones.

#### **Pacific Crest Trail (PCT)**

- a. "Neck-down" construction zone from 95' to 75' across the trail
- b. UCSA's eliminated within "necked-down" zones.
- c. Shorten the potential visual corridor by turning the corridor on both ends of the crossing
- d. Plant a row or cluster of trees and/or shrubs across the right of way to provide visual screens at trail crossing
- e. Revegetate with native trees, shrubs, and plants

#### **Dead Indian Memorial Road**

- a. "Neck-down" construction zone from 95' to 75' across the road
- b. UCSA's eliminated within "necked-down" zones.
- c. Shorten the potential visual corridor by turning the corridor on both ends of the crossing
- d. Plant a row or cluster of trees and/or shrubs across the right of way to provide visual screens at road crossing
- e. Revegetate with native trees, shrubs, and plants
- f. Place barrier to discourage Off-highway vehicle use

#### **Clover Creek Road**

- a. Relocate Block Valve 12
- b. Regrade to approximate original contour

## PCGP Forest Service Visual Management Mitigation Analysis

- c. Reseed construction right-of-way (ROW) area
- d. Scatter slash across the right of way
- e. Replant with seedlings

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### Site Specific Analysis of Affects on Scenery Resources

#### Big Elk Road Crossing

##### Forest Plan Standards

VQO- Foreground Retention

##### Visibility

The pipeline crosses Big Elk Road (FS RD 37) in a west-east alignment which runs through a mixed conifer forest. The route would be viewed from a foreground distance; however, the duration of the view is very short for those traveling on the highway at an average speed of 50mph. The broad 75' construction swath perpendicular to the road will attract the eye because of the existing vegetation that creates a tunnel effect along the roadway. The visual effect of a cleared corridor will be similar to an intersecting road. The corridor will be the single deviation from the contiguous edge of the timber along the road.

##### Visual Absorption Capability

The heavy timber canopy is very contiguous, decreasing the visual absorption capability. The terrain is very flat in this area. The view of the ROW is limited by the width and depth to which the viewer can see down the ROW. The Visual absorption capability is not a factor in immediate foreground viewing situations.

##### Visual Effects

The immediate visual effects created by the ROW will be a strong linear feature with strong edges at each side. The color contrast of the exposed soils will be evident, and the scale of the opening will be uncharacteristic to the surrounding landscape. The berm, boulders, and root wads created to block OHV users from accessing the site will draw attention to the corridor as these negative elements detract from the natural appearing landscape.

##### Seasonal Changes

The ROW corridor will be most evident in the winter when the snow creates the strongest contrast to the coniferous forest. Spring, summer, and fall will be similar in effects other than the changing color of the seeded grasses and shrubs.

##### Expected Results of Proposed Mitigation

The immediate effects of the PCGP corridor to the visual resource are unacceptable modification. The 75' swath with the tall adjacent tree line edges will be uncharacteristic to the surrounding landscape. A small cluster of trees a

## **PCGP Forest Service Visual Management Mitigation Analysis**

height less than 40' in height will not screen the open swath created by the corridor. The logs and boulders proposed to be strewn across the PCGP are unacceptable. Placing root wads in the uncleared storage areas is an unacceptable practice in all areas that are visible, regardless of the sensitivity level. After the grasses and shrubs begin to grow, the soil color contrast will be reduced as the exposed soils are covered. Shrubs will add texture and color variation to the flat plane.

It is expected that creating openings in this area will create frost pockets and hamper revegetation efforts. Revegetation could take as long as 20-30 years if successful at all. This is seen in strip cut harvests in the area that have taken 30 years to revegetate. Once the PCGP corridor is revegetated the cleared width will be reduced to a minimum of 30 feet in width. The expected results of the proponents restoration efforts will eventually meet modification, but not within five years. It is expected that it could take 20 to 30 years to fully revegetate and at this time the project is expected to meet partial retention.

### **Forest Service Mitigation Measures**

#### **Potential/Recommended Forest Service Mitigation Measures**

The following mitigation measures shall be done in the construction ROW and TEWAs from the edge of Big Elk Road to where the corridor makes the turn and is no longer visible from the Big Elk Road.

#### **1.0 Soil Color Contrast Mitigation**

1.1 Chip slash to: a. mulch ROW to manage slash production, b. reduce soil erosion, and, c. retain soil moisture to increase revegetation success.

1.2 Where using hydro-mulch to avoid erosion, use colorant (commercially available) dark brownish green to reduce color contrast.

#### **2.0 Edge/Form Mitigation**

2.1 Scallop edges by removing trees in areas designated by the forest service landscape architect in consultation with Pacific Connector's Environmental Inspector(s) to reduce the straight linear edge, and change shadow cast patterns.

2.2 Feather edges of ROW by cutting some tall trees (40'+) along the immediate edge, leaving trees of heights at 10-40' in height for a distance of 50-100'. Feathering shall be done in accordance to advisement of forest service landscape architect and in coordination with Pacific Connector's EI(s).

#### **3.0 Revegetate for Reduction of Width and Improving Form**

## **PCGP Forest Service Visual Management Mitigation Analysis**

3.1 Transplant trees of 15' to 20' height into the ROW in clusters by using a tree spade to immediately reduce the sharp linear edge, and break up the wide barren swath. Transplant 15- 20 trees per 1/8<sup>th</sup> mile to blend the corridor into existing tree densities, in accordance to advisement of forest service landscape architect and in coordination with Pacific Connector's EI(s).

### **4.0 Treatment of TEWAS in highly visible areas**

4.1 Transplant trees into the TEWAS in clusters by using a tree spade. Combine with partially buried (1/3-1/2 recess) boulders to create groupings for wildlife use and to appear more natural.

4.2 Treat compacted soils by sub soiling to aerate the soils where necessary as discussed in the ECRP, Section 10.

### **5.0 Root wad and Boulder Placement in Immediate Foreground**

5.1 Every effort shall be made to bury all root wads and boulders within the ROW.

5.2 Root wads and boulders larger than one foot in diameter that are placed in the immediate foreground (300') shall be partially buried to approximately 1/3 the height of the boulder and 1/3 the height of the root wad. Cut faces should be directed away from the viewer platform, or concealed with soil or boulders. Root wads and boulders shall be placed in groupings of approximately 3 root wads and 2 boulders. There shall be no more than about one grouping per 1/8<sup>th</sup> mile within Retention areas or Class I areas. In partial retention areas/Class II areas there shall be approximately 3 groupings per 1/8<sup>th</sup> mile. See Diagram C – Linear Guideline Template for typical construction. All mitigation measures shall be constructed under the on-site advisement of a scenery specialist in consultation with Pacific connector's EI(s) during the time of construction.

### **6.0 Treatment of Soil Compaction**

6.1 Subsoiling and other soil compaction mitigations shall occur in areas determined necessary as per the ECRP Section 4.2.3 to reduce soil compaction and to improve success of revegetation efforts.

### **7.0 Planting Shrubs**

7.1 Plant 1-2 gallon sized shrubs and protect with plant guards. This will reduce the soil contrast and the single plane of the open forest floor. Plant as designated on the site plan for the immediate foreground of the site.

### **8.0 Blocking from OHV use**

8.1 Construct a berm with boulders to discourage access from OHV use.

## **PCGP Forest Service Visual Management Mitigation Analysis**

### **9.0 Screening**

9.1 Screen the corridor from the viewer by leaving specific trees near the roadway that can be worked around, and transplanting trees of 15-20ft height in groupings in the immediate foreground, as designated by the forest service landscape architect and in coordination with Pacific Connector's EI(s).

### **10.0 Plant deciduous trees and shrubs for fall color.**

10.1 Plant willow, ceonothus, ribes, huckleberry, chinquapin as designated by the site plan.

### **11.0 Plant deciduous trees and shrubs for fall color.**

11.1 Plant willow, ceonothus, ribes, huckleberry, chinquapin as specified in the ECRP.

## PCGP Forest Service Visual Management Mitigation Analysis

### Site Specific Design Mitigations

See section with diagrams.

#### Expected Results of Recommended Mitigation

The expected result of the recommended mitigations is that the visual quality level may be partial retention in 10 years if revegetation efforts and mitigations are successful. The Scenery Management System does not specify a timeframe for meeting Retention or High Scenic Integrity, however the Visual Management System requires that Retention VQO be met during or immediately after project completion.

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### Dead Indian Memorial Road Crossing

#### Forest Plan Standards

VQO- Foreground Retention

#### Visibility

The pipeline crosses Dead Indian Memorial Road (FS RD 37) in a west-east alignment which runs through a lodge pole ecotone vegetation type. The route would be viewed from a foreground distance; however, the duration of the view is very short. The broad 75' construction swath will attract the eye because the existing vegetation that creates a tunnel effect along the roadway. The northwest pipeline alignment bends approximately 600' from the edge of the road reducing the sight line distance down the corridor.

#### Visual Absorption Capability

The heavy timber canopy is very contiguous, decreasing the visual absorption capability. The terrain is very flat in this area. The view of the ROW is limited by the width and depth to which the viewer can see down the ROW.

#### Visual Effects

The immediate visual effects created by the ROW will be a strong linear feature with strong edges at each side. The color contrast of the exposed soils will be evident, and the scale of the opening will be uncharacteristic in the surrounding landscape. The proposed berm, boulders, and root wads created to block OHV users from accessing the site will draw attention to the corridor as these negative elements detract from the natural appearing landscape. This crossing will also likely create a 'daylight' cut into the cut bank along the edge of the road. This cut will also attract the eye to the corridor.

#### Seasonal Changes

The ROW corridor will be most evident in the winter when the snow creates the strongest contrast to the coniferous forest. Spring, summer, and fall will be



## PCGP Forest Service Visual Management Mitigation Analysis

similar in effects other than the changing color of the seeded grasses and shrubs.

### Expected Results of Proposed Mitigation

The immediate effects of the ROW corridor are unacceptable modification. The 75' swath with the tall adjacent tree line edges will be uncharacteristic to the surrounding landscape. The proposed logs and boulders strewn across the ROW are unacceptable. Placing root wads in the uncleared storage areas is an unacceptable practice in all areas that are visible. After the grasses and shrubs begin to grow, the soil color contrast will be reduced as the exposed soils are covered.

It is expected that creating openings in this area will create frost pockets and hamper revegetation efforts. Revegetation could take as long as 20-30 years if successful at all. This is seen in strip cut harvests in the area that have taken 30 years to revegetate. Once this occurs the cleared ROW will be reduced to a minimum of 30 feet width. These practices will eventually meet modification, but not within five years.

The Winema National Forest Visual Quality Objective in this area is foreground retention. This proposal does not meet this objective, and is never expected to meet it, although there will be a filling in of vegetation and softening of appearance overtime.

### Forest Service Mitigation Measures

#### Recommended Forest Service Mitigation Measures

The following mitigation measures shall be done in the construction ROW and TEWA(s) from the edge of Dead Indian Memorial Road to 600 feet beyond the immediate foreground.

#### 1.0 Soil Color Contrast Mitigation

1.1 Chip slash to mulch ROW to: a. manage slash production, b. reduce soil erosion, and, c. retain soil moisture to increase revegetation success.

1.2 Where using hydro-mulch to avoid erosion, use colorant (commercially available) dark brownish green to reduce color contrast.

#### 2.0 Edge/Form Mitigation

2.1 Scallop edges by removing trees in designated areas to reduce the straight linear edge, and change shadow cast patterns.

2.2 Feather edges of ROW by cutting tall trees (40'+) along the immediate edge, leaving trees of heights at 10-40' in height for a distance of 50-100'. Feathering shall be done in accordance to advisement of forest service



## **PCGP Forest Service Visual Management Mitigation Analysis**

(FS) landscape architect and in coordination with Pacific Connector's EI(s).

### **3.0 Revegetation for Reduction of width and improving form**

3.1 Transplant trees into the ROW in clusters by using a tree spade to immediately reduce the sharp linear edge, and break up the wide barren swath.

### **4.0 Treatment of TEWAS in Scenic Areas**

4.1 Transplant trees that are root pruned a year in advance, into the TEWAS in clusters by using a tree spade. Combine with boulders to create groupings for wildlife use and to appear more natural.

### **5.0 Root wad and Boulder Placement in Immediate Foreground**

5.1 Every effort shall be made to bury all root wads and boulders within the ROW.

5.2 Root wads and boulders placed in the immediate foreground (300') should be partially buried to approximately 1/3 the height of the boulder and 1/3 the height of the root wad. Cut faces should be directed away from the viewer platform, or concealed by boulders or berms. Root wads and boulders shall be placed in groupings of approximately 3 root wads and 2 boulders. There shall be about one grouping per 1/8<sup>th</sup> mile within Retention areas or Class I areas. In partial retention areas/Class II areas there shall be approximately 3 groupings per 1/8<sup>th</sup> mile. See Diagram C – Linear Guideline Template for typical construction. All mitigation measures shall be constructed under the on-site advisement of a scenery specialist and in coordination with Pacific Connector's EI(s) during the time of construction.

### **6.0 Treatment of Soil Compaction**

6.1 Subsoiling and other soil compaction mitigations shall occur in areas determined necessary as per the ECRP Section 4.2.3 to reduce soil compaction and to improve success of revegetation efforts.

### **7.0 Planting Shrubs**

7.1 Plant 1-2 gallon size shrubs and protect with plant guards, in order to decrease the amount of time needed to address soil contrast and the single plane of the open forest floor. Plant as directed by the FS Landscape Architect and in coordination with Pacific Connector's EI(s).

### **8.0 Blocking from OHV use**

8.1 Construct a berm with partially recessed boulders to discourage the access from OHV use. Construct as designated by the FS Landscape Architect and in coordination with Pacific Connector's EI(s).

## **PCGP Forest Service Visual Management Mitigation Analysis**

### **9.0 Screening**

9.1 Screen the corridor from the viewer by leaving specific trees near the roadway that can be worked around, and transplanting trees of 15-20ft height in groupings in the immediate foreground, as designated by the FS Landscape Architect.

### **10.0 Plant deciduous trees and shrubs for fall color.**

10.1 Plant willow, ceonothus, ribes, huckleberry, chinquapin as designated in the ECRP.

### **11.0 Reconstruct the cut bank**

11.1 Recontour the cut bank to discourage OHV access, and to reduce the distractive effect of to the edge of the roadway as advised by FS Landscape Architect and in coordination with Pacific Connector's EI(s).

### **12.0 Scenic Stability**

12.1 Develop a mitigation fund for National Forest project work related to design, NEPA, and implementation of thinning and a fuel break along the highway. This project would thin trees in a variable transition zone 50 to 500 feet in width along the highway, to reduce tree density, fuel loadings, and percent of canopy closure appropriate to the species. This project would open up the stands and reduce the risk of losing existing scenic attributes, and recommended mitigation efforts in the event of a large stand replacement fire.

### **Expected Results of Mitigation to Meet Partial Retention VQO**

The expected result of the recommended mitigations is that the visual quality level may be Partial Retention in 10 years if revegetation and mitigations are successful. The Scenery Management System does not specify a timeframe for meeting Retention or High Scenic Integrity, however the Visual Management System requires that Retention VQO be met during or immediately after project completion.

### **Mitigations to Meet Retention VQO**

The forest plan standard for this area is Foreground Retention. This means that impacts are not visually evident from a foreground view.

The pipeline would have continued effects of a 30' overstory strip opening, meaning that for a distance of 600ft in one direction and 600ft in the other there will be an open sky strip. This is due to the removal of trees over 15ft and shrubs over 6ft. Because this strip is retained through out the existence of the pipeline in this location, retention would not ever be met; given the recommended mitigation measures within and along the edge of the ROW.

## PCGP Forest Service Visual Management Mitigation Analysis

Granted this strip would be seen from a moving car only for a short period of time, but the Visual Management system does not address duration of the view of an impact, other than to consider duration in the scenic class inventory. Due to the sensitivity level of this road, along with the scenic attractiveness and viewed distance, this area was assigned a Retention VQO in the Forest Plan standards and guidelines.

The recommended visual mitigation calls for softening the strip effect by scalloping and feathering the edges (2.1 and 2.2). This would soften the effect but would not make the strip “not visually evident”.

In order to meet retention, the strip effect must be addressed. Address meaning make it “not visually evident”. To do this the surrounding timbered area would need to be sufficiently “opened up” to allow the open sky to be visible to the viewer traveling along this route, so that when the viewer drives by the crossing the open sky is not differing from the visual experience provided on either side of the crossing. So, this would be a designed project that would create a gradual thinning that increased the open sky view as the viewer approached the crossing point until the opening sky view was no longer a strip within a contiguous forest, but just an open sky view afforded to the viewer that does not appear unnatural in form, line, color, and texture. This is a project that could occur beyond the ROW, probably a ¼ to ½ mile each direction of the crossing point, and for a 600ft on both sides of the road. This kind of project could mimic a natural occurrence such as an insect and disease opening that often occurs in this lodge pole vegetation type. (Please validate with a silviculturist, ecologist, or entomologist) Over time this type of thinning would have to be maintained or the contiguous forest would “come back”, and the strip over the pipeline would once again become visually evident. This type of treatment could also be considered in the form of a fuel break, which would be considered, within SMS appendix J an action that could improve scenic stability by reducing the potential breadth of a stand replacement fire to a scale that is within the natural range of variability.

If this type of approach was included in the chosen alternative, then retention could be met as soon as soil color contrast mitigation was successful, and transplanted trees within the 75’ corridor reached 20ft in height. The transplanted tree density would need to mimic the modified basal area of the surrounding area to blend the corridor into the landscape. Retention would not be met immediately nor within a year or one growing season, but it could eventually be met.

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### Pacific Crest Trail Crossing

#### Forest Plan Standards

VQO- Foreground Partial Retention

#### Visibility

## **PCGP Forest Service Visual Management Mitigation Analysis**

The PCGP ROW crosses the Pacific Crest Trail within late successional reserve timber, where large trees are the prominent visual element. The perpendicular crossing will create a 75' clearing across the trail which is currently an 8-10' corridor. The ROW clearing is excessively out of scale in this landscape, especially when experienced on foot. The clearing will extend for approximately .8 miles in both directions.

### **Visual Absorption Capability**

There is no absorption capability that will lessen the visibility of this proposed right of way and its effects.

### **Visual Effects**

The immediate visual effects include soil color contrast to existing adjacent vegetation, excessive vegetative clearing uncharacteristic in width and breadth, hard, linear edges, proposed distribution of extensive root wads, and boulders in the uncleared storage areas.

The planned logs and boulders strewn across the ROW will be very unnatural appearing even when the grasses and shrubs grow up. As trees grow to a height of 20 feet, the edges will begin to soften as tree boughs will begin to blend with adjacent trees, and the width of the vegetatively cleared ROW will eventually be reduced to 30 feet.

### **Seasonal Changes**

The ROW corridor will be most evident in the winter when the snow creates the strongest contrast to the coniferous forest. Spring, summer, and fall will be similar in effects other than the changing color of the seeded grasses and shrubs.

### **Expected Results of Proposed Mitigation Measures**

The immediate effects of the cleared ROW corridor are unacceptable modification.

It is expected that the soil color contrast, the broad opening, and the strewn logs and boulders in addition to the root wads and boulders stored in the uncleared storage areas will create an excessive amount of visual disturbance. The effects proposed activity are visually unrelated to those in this characteristic landscape. Seeding and transplanting will not be successful in blending the proposed changes within the foreground view with the existing landscape until the ground vegetation is restored; the hard linear edges of the clearing are softened. It is expected that the proposed mitigation measures will not be successful in achieving modification for the first five years. Opening the forest canopy up like this may create a frost pocket that will be difficult to revegetate in a timely manner.

## **PCGP Forest Service Visual Management Mitigation Analysis**

### **Proposed/Recommended forest Service Mitigation Measures**

The following mitigation measures shall be done in the construction ROW and TEWA(s) from the edge of the PCT to where the corridor makes the turn and is no longer visible from the PCT.

#### **1.0 Soil Color Contrast Mitigation**

1.1 Chip slash to mulch the cleared ROW to: a. manage slash production, b. reduce soil erosion, and c. retain soil moisture to increase revegetation success.

1.2 Where using hydro-mulch to avoid erosion, use colorant (commercially available) dark brownish green to reduce color contrast.

#### **2.0 Edge/Form Mitigation**

2.1 Scallop edges by removing trees in designated uncleared storage areas to reduce the straight linear edge, and change shadow cast patterns.

2.2 Feather edges of ROW by cutting tall trees (40'+) along the immediate edge, leaving trees of heights at 10-40' in height for a distance of 50-100' to graduate the edge from mid-sized to full height. Feathering shall be done in accordance to advisement of forest service landscape architect and in coordination with Pacific Connector's EI(s).

#### **3.0 Revegetate for Reduction of width and improving form**

3.1 Transplant trees of 15' to 20' height into the ROW in clusters by using a tree spade to immediately reduce the sharp linear edge, and break up the wide barren swath. Root prune selected native vegetation a year in advance of transplant to increase success rate.

#### **4.0 Treatment of TEWAS in highly visible areas**

4.1 Transplant trees into the TEWAS in clusters by using a tree spade. Combine with groupings of boulders to create clumps for wildlife use and to appear more natural. Treat compacted soils by sub soiling to aerate the soils.

#### **5.0 Root wad and Boulder Placement in Immediate Foreground**

5.1 Every effort shall be made to bury all root wads and boulders within the pipeline ROW.

5.2 Root wads and boulders placed in the immediate foreground (300') should be partially buried to approximately 1/3 the height of the boulder and 1/3 the height of the root wad. Cut faces should be directed away from the viewer and cut ends concealed with soil and boulder placement. Root wads and boulders shall be placed in groupings of approximately 2

## PCGP Forest Service Visual Management Mitigation Analysis

root wads and 3 boulders. There shall be about one grouping per 1/8<sup>th</sup> mile within Retention areas or Class I areas. In partial retention areas/Class II areas there shall be approximately 3 groupings per 1/8<sup>th</sup> mile. See Diagram C – Linear Guideline Template for typical construction. All mitigation measures shall be constructed under the on-site advisement of a scenery specialist during the time of construction.

### 6.0 Treatment of Soil Compaction

6.1 Subsoiling and other soil compaction mitigations shall occur in areas determined necessary as per the ECRP Section 4.2.3 to reduce soil compaction and to improve success of revegetation efforts.

### 10.0 Planting Shrubs

10.1 Plant 1-2 gallon size shrubs and protect with plant guards to decrease the amount of time needed to address soil color contrast and the single plane of the open forest floor. Plant as designated on the site plan for the immediate foreground of the site.

### Site Specific Designed Mitigation

Diagrams in a following section.

### Expected Results of Recommended Mitigation

The expected result of the recommended mitigations is that the visual quality level would be Modification within 15-20 years. The hikers along this trail are very observant and the speed at which they travel will allow them ample time to view the ROW, so it is expected that they will notice more of the effects of the corridor, but the edges will soften by vegetative growth.

The Scenery Management System does not specify a timeframe for meeting Retention or High Scenic Integrity, however the Visual Management System requires that Retention VQO be met during or immediately after project completion. This will not be the case with the proposed action.

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### Clover Creek Road

#### Forest Plan Standards

VQO- Foreground Partial Retention

#### Visibility

The PCGP ROW is located directly adjacent to the Clover Creek Road for over 18 miles. Eight miles of these are FS lands. The adjacent alignment will increase the apparent roadway corridor width from 54' to 149', almost tripling the



## **PCGP Forest Service Visual Management Mitigation Analysis**

existing width. This 95' additional width for the ROW is fully visible in an immediate foreground view. The cumulative effect of the project area across all jurisdictions will dominate the view for the entire 18 miles.

### **Visual Absorption Capability**

There is no absorption capability that will lessen the visibility of this proposed right of way and its effects.

### **Visual Effects**

The immediate visual effects include soil color contrast to existing adjacent vegetation, grossly uncharacteristic scaled opening in width and breadth; hard, linear edge, extensive number root wads, and boulders strewn in the uncleared storage areas.

The logs and boulders strewn across the ROW are unacceptable. Permanently placing root wads in the uncleared storage areas is an unacceptable practice in all areas that are visible. (Pg. 39, National Forest Landscape Management, Vol. 2.) After the grasses and shrubs beginning to grow the soil color contrast will be reduced as the exposed soils are covered. Shrubs will add texture and color variation to the flat plane. As trees grow to a height of 20 feet, the ROW edges will be softened, and the width of the ROW will eventually be reduced to 30 feet. Where adjacent to the 54' roadway, the full opening will be 84'.

### **Seasonal Changes**

The ROW corridor will be most evident in the winter when the snow creates the strongest contrast to the coniferous forest. Spring, summer, and fall will be similar in effects other than the changing color of the seeded grasses and shrubs. Seasonal changes will not make enough difference to note in the foreground, because the scale of the opening and the adjacency to the road makes the effects undifferentiated by seasonal change.

### **Expected Results of Proposed Mitigation Measures**

The immediate effects of the ROW corridor are unacceptable modification. The 95' swath with the tall adjacent tree line edges will be uncharacteristic to the surrounding landscape. The extensive number of logs and boulders strewn across the ROW is unacceptable. Placing root wads in the uncleared storage areas is an unacceptable practice in all areas that are visible. After the grasses and shrubs beginning to grow the soil color contrast will be reduced as the exposed soils are covered. Revegetation could take as long as 20-30 years. Once this occurs the cleared ROW will be reduced to a minimum of 30 feet width. These practices will result in unacceptable modification.

### **Recommended Forest Service Mitigation Measures**

The extensive project activities within immediate foreground of this road require site specific designed mitigation. See the Clover Creek mitigation measures by zone, and the template diagrams.

## **PCGP Forest Service Visual Management Mitigation Analysis**

### **1.0 Soil Color Contrast Mitigation**

1.1 Chip slash to mulch cleared ROW to: a. manage slash production, b. reduce soil erosion, and c. retain soil moisture to increase revegetation success.

1.2 Where using hydro-mulch to avoid erosion, use colorant (commercially available) dark brownish green to reduce color contrast.

### **2.0 Edge/Form Mitigation**

2.1 Scallop edges by removing trees in designated areas to reduce the straight linear edge, and change shadow cast patterns.

2.2 Feather edges of ROW by cutting tall trees (40'+) along the immediate edge, leaving trees of heights at 10-40' in height for a distance of 50-100'. Feathering shall be done in accordance to advisement of forest service landscape architect and in coordination with Pacific Connector's EI(s).

### **3.0 Revegetate for Reduction of Width and Improving Form**

3.1 Transplant trees into the cleared ROW in clusters by using a tree spade to immediately reduce the sharp linear edge, and break up the wide barren swath.

### **4.0 Treatment of TEWA(s) in highly visible areas**

4.1 Transplant trees into the TEWA(s) in clusters by using a tree spade. Combine with groupings of recessed boulders to create clumps for wildlife use and to appear more natural.

### **5.0 Root wad and Boulder Placement in Immediate Foreground**

5.1 Every effort shall be made to bury all root wads and boulders within Row clearing.

5.2 Root wads and boulders placed in the immediate foreground (300') should be partially buried to approximately 1/3 the height of the boulder and 1/3 the height of the root wad. Cut faces should be directed away from the viewer and cut ends concealed with soil and or boulders. Root wads and boulders shall be placed in groupings of approximately 3 root wads and 2 boulders. There shall be about one grouping per 1/8<sup>th</sup> mile within Retention areas or Class I areas. In partial retention areas/Class II areas there shall be approximately 3 groupings per 1/8<sup>th</sup> mile. See Diagram C – Linear Guideline Template for typical construction. All mitigation measures shall be constructed under the on-site advisement of a scenery specialist and in coordination with Pacific Connector's EI(s) during the time of construction.

### **6.0 Treatment of Soil Compaction**



## **PCGP Forest Service Visual Management Mitigation Analysis**

6.1 Subsoiling and other soil compaction mitigations shall occur in areas determined necessary as per the ECRP Section 4.2.3 to reduce soil compaction and to improve success of revegetation efforts.

### **7.0 Planting Shrubs**

7.1 Plant 1-2 gallon size shrubs and protect with plant guards to decrease the amount of time needed to address soil contrast and the single plane of the open forest floor. Plant as designated by the FS Landscape Architect and in coordination with Pacific Connector's EI(s).

### **8.0 Screening**

8.1 Screen the corridor from the view by leaving specific trees near the roadway that can be worked around. Transplant trees 15-20ft in height. Construct groupings in the immediate foreground, as designated by the FS Landscape Architect.

### **11.0 Plant deciduous trees and shrubs for fall color.**

11.1 Plant willow, ceonothus, ribes, huckleberry, chinquapin as designated by the ECRP.

### **Specific Site Designed Mitigations by Zone and Topography**

These zones are shown on the template diagrams.

#### **Zone A – Uncleared Storage Areas**

This zone is an area that is not cleared for construction but used for storage of equipment, construction materials and root wads and boulders. This zone is near the edge of the construction corridor where vegetation remains, and where thick forest creates a strong edge or wall. This edge needs to be “feathered” by thinning the trees, leaving larger, fire resistant species. After construction this zone shall only be used for storing root wads and boulders in areas that are not visible from the road. The root wad and boulder storage should be fully screened by existing topography, or transplanted vegetation. Root wads and boulders can be buried under earthen berms that are designed as gentle rises in scale with other topographic variation in the area to blend with the existing natural environment. All berms shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on-site slash and fertilized to promote rapid revegetation. Transplanted trees and shrubs planted to screen storage areas shall be an average height of 15-20 feet in height. See transplanted berm diagram.

#### **Zone B – Offside Topsoil and Subsoil Storage Area**

This zone is an area across the pipeline trench that is utilized during construction to store topsoil and excavated soils from the pipeline trench. After construction this area shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on-site slash and fertilized to promote rapid revegetation. This zone shall have a minimum of 10 -15 transplanted trees depending on the

## **PCGP Forest Service Visual Management Mitigation Analysis**

density of trees in Zone A to immediately soften the edge of the clearing, and/or screen boulders and root wads. This zone may be used for burying boulders and root wads. See transplanted berm diagram.

### **Zone C – 30' Corridor Directly above Pipeline**

This zone is centered directly over the pipeline, and will remain open via clearing of trees greater than 15' in height, and shrubs greater than 6' in height. Within this 30' span root wads and boulders can be buried. After construction this area shall be seeded/hydro mulch with native seed mix, mulched with chips generated from on site slash and fertilized to promote rapid revegetation. Boulder and root wad groupings may be designed into this corridor. See Boulder and Root wad Grouping Diagram. A maximum of about three groupings per quarter mile shall be placed within the entire block of zones. Groupings can be used to break up the open plan of the 30' corridor.

### **Zone D – Working Zone**

This zone is between the existing road and the pipeline trench. During construction this area will receive the greatest level of equipment and truck traffic; therefore, soil compaction will be highest in this area. This area shall be wing subsoil treated to restore the soil aeration and improve the success of the restoration efforts. After construction this area shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on site slash and fertilized to promote rapid revegetation. Boulder and root wad groupings may be designed into this zone. Berms shall be designed to break up the flat plane of the construction working surface, and to bury boulders and root wads. Logs and slash shall be placed behind berm

### **Zone E – The Road Side Edge**

The road side edge is the zone that is between the construction zone, and the edge of the existing road. This zone is the equivalent of an uncleared storage area in other areas, but adjacent to the Clover Creek Road, this area shall vary in width, usage and treatment depending on the existing topography and vegetation.

Where this zone is level, or within 5-10 feet of the roadway elevation, a minimum of 25% of the existing shrubs and trees shall be retained in clumps to provide diverse form, color and texture to the roadside edge. All areas that are impacted by construction shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on site slash and fertilized to promote rapid revegetation. There shall be no root wads, boulders or logs or slash placed in this zone.

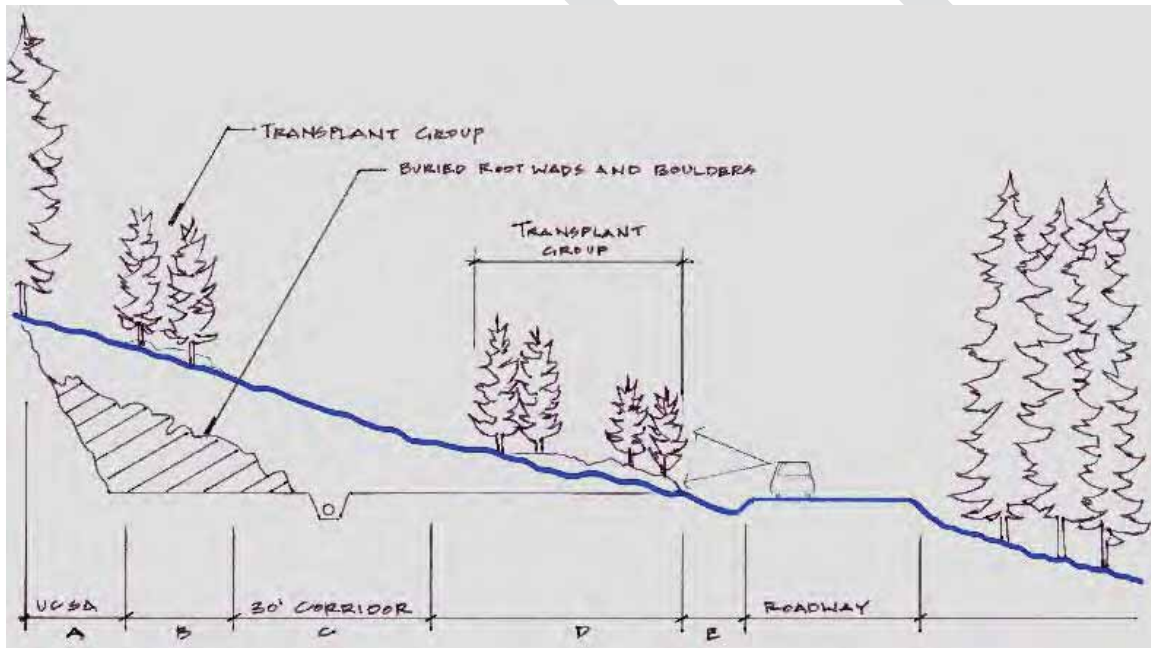
Where this zone is sloping downward and away from the road at 30% or greater, vegetation high enough to screen the 30' corridor opening shall be retained. Root wads and boulders can be stored at the base of the slope meets the graded construction zone surface, where retained vegetation provides screening.

## PCGP Forest Service Visual Management Mitigation Analysis

Where this zone is sloping upward, and away from the road at 30% or greater, retained vegetation will provide diversity in form, color and texture. It is expected that where the road route is adjacent to a cut bank along the road that is greater than 10' in height, the PCGP ROW will be pulled back away from the cut bank by 20-30 feet. All areas that are impacted by construction shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on site slash and fertilized to promote rapid revegetation. There shall be no root wads, boulders or logs or slash placed in this zone.

### Template Diagrams

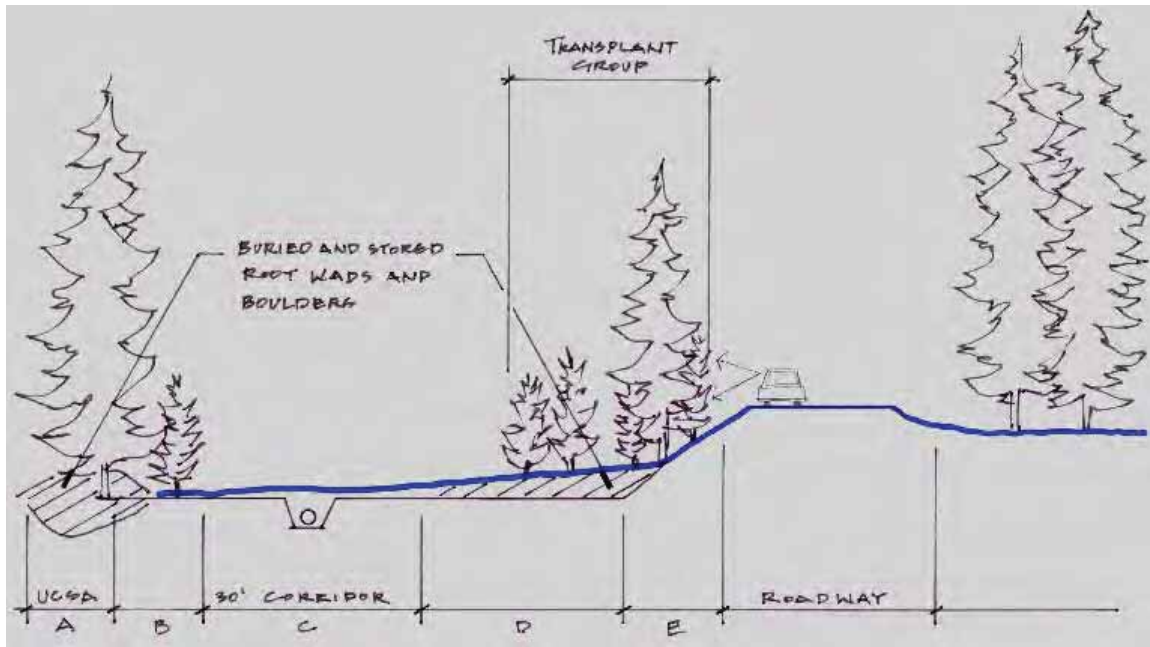
The following template diagrams specify mitigation measures to be used based on the topography. The diagrams are to be used in conjunction with the linear guidelines. The diagrams are typical templates to be used under the advisement of the FS Landscape Architect and in coordination with Pacific Connector's EI(s) that is available on site at the time of construction.



### Diagram A –PCGP Above the Roadway

Bury root wads and boulders under the soil used to recontour the excavation zone. Construct transplant groupings as shown in the linear guideline diagram.

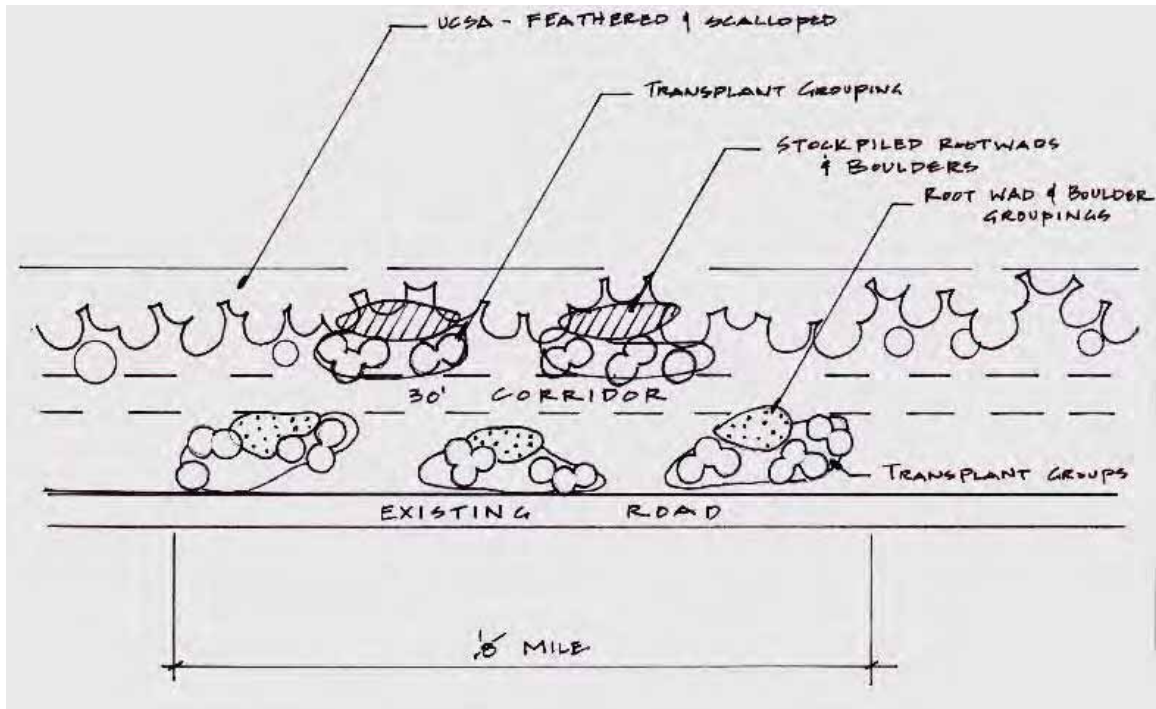
## PCGP Forest Service Visual Management Mitigation Analysis



### Diagram B –PCGP is below the roadway

Bury and store root wads and boulders where screened from the view of the viewer on the Clover Creek Road. Transplant trees and shrubs in groupings to create diverse spatial patterns, and to break up the strong linear form of the retained vegetation. Retain vegetation on the bank of the roadway.

## PCGP Forest Service Visual Management Mitigation Analysis

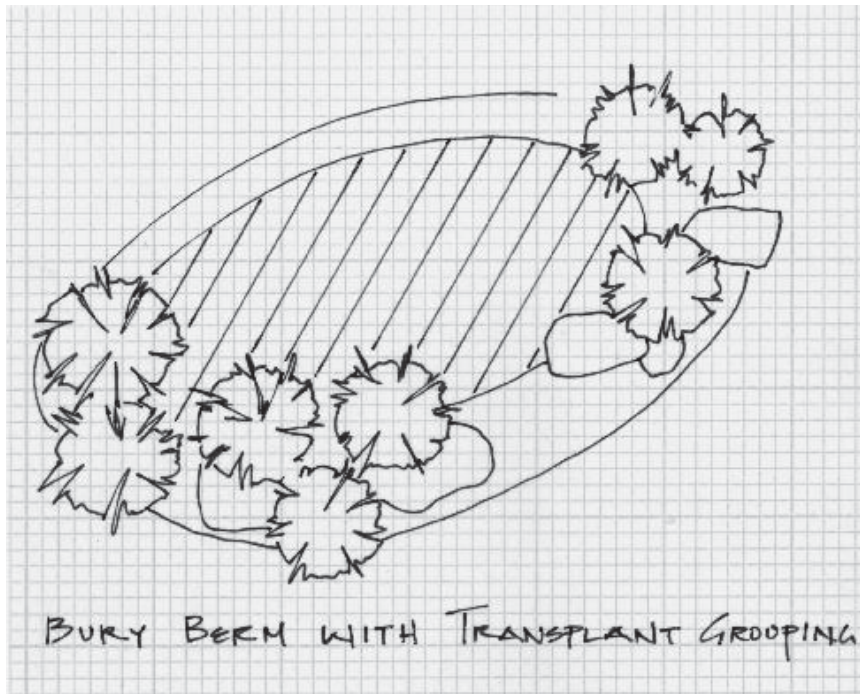


**Diagram C – Linear Guideline Template for 1/8<sup>th</sup> Mile**

Construct root wad and boulder groupings behind transplant groups. Feather and scallop the uncleared storage areas, and stockpile root wads and boulders behind transplant groupings. Limit root wad and boulder groupings to approximately 3 per 1/8<sup>th</sup> mile.

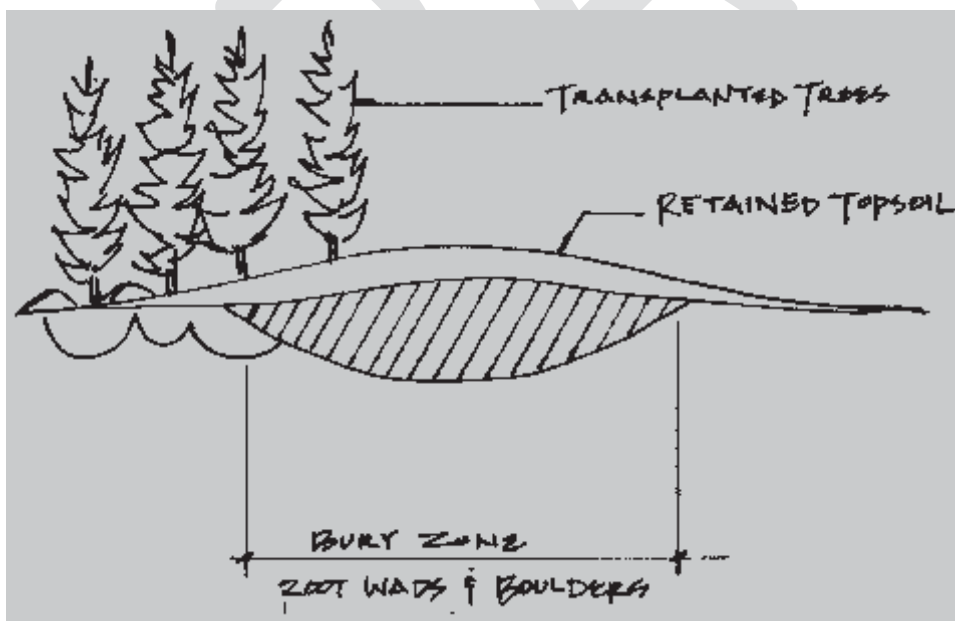


## PCGP Forest Service Visual Management Mitigation Analysis



**Diagram D – Bury Berm with Transplant Grouping**

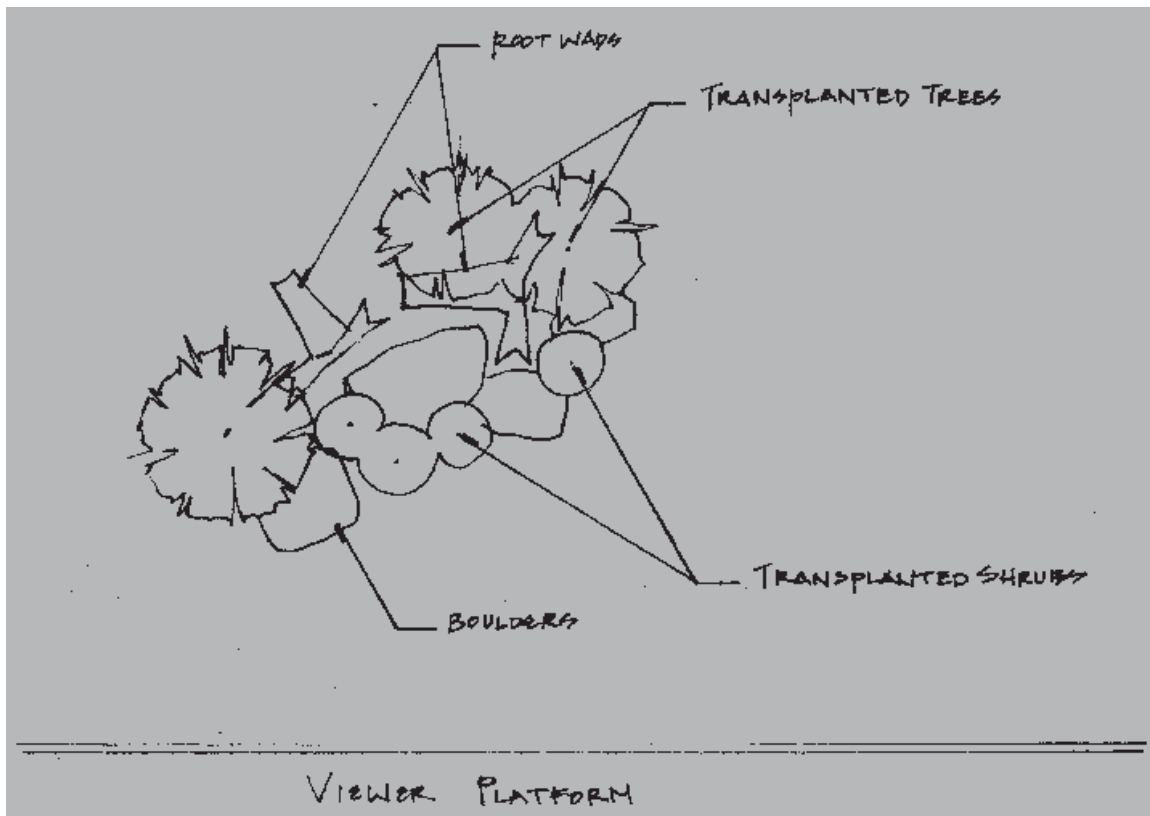
Bury root wads and boulders and construct a berm with retained topsoil. Plant the edges of the berm with transplanted trees, and place recessed boulders in the designed grouping.



**Diagram E – Bury Berm with Transplant Grouping**

Plant at edges of bury zone.

## PCGP Forest Service Visual Management Mitigation Analysis



### Diagram F – Root Wad and Boulder/Transplant Grouping

Construct groupings to vegetate the cleared ROW.

### Expected Results of Mitigation to Meet Modification VQO

The expected results are based on the above mitigations and the specific site designed mitigation by zone and topography.

The immediate foreground of the Clover Creek Road, being heavily modified by pipeline construction would undergo extensive mitigation and over a long period of time will meet modification. Treating the soils by sub soiling, chip and hydro mulching, seeding and planting shrubs and grasses will address the impacts to the forest floor. Screening and burying boulders and root wads, designed berms and transplanted tree groupings will rebuild the foreground view, although the linear 30 foot ROW will always be evident..

It is expected that it will take approximately 10 to 15 years for this to be accomplished. Under the Scenery Management System this is an acceptable time frame, however under the Visual Management System, Partial Retention must be met within the second to third year after completion of the project.

## PCGP Forest Service Visual Management Mitigation Analysis

### Mitigation to Meet Partial Retention VQO

The forest plan standard for this area is foreground partial retention. This means that impacts “remain visually subordinate to the characteristic landscape”.

The continued removal of trees over 15ft and shrubs over 6ft within the immediate foreground of the Clover Creek Rd for the extended length of approximately 18 miles (8 miles being FS lands) would keep a 30ft corridor clear of vegetation less than 15ft in height. This is considered a linear corridor that is inconsistent with the characteristic landscape surrounding the project area. Because this strip is retained throughout the existence of the pipeline in this location, partial retention would not ever be met given the recommended mitigation measures within and along the edge of the ROW.

In order to meet partial retention, the corridor effect must be addressed. Address meaning make the corridor effect “visually subordinate”. To do this the surrounding timbered area would need to be sufficiently “opened up” to a degree that the corridor no longer appears as a contiguous linear feature, but is more like openings that are consistent with those in the surrounding characteristic landscape. This means consistent in “size, amount, intensity, direction, pattern, etc.” Any introduced form, line, color, or texture that is introduced should remain subordinate to the visual strength of the characteristic landscape.”

To do this the surrounding timbered area would need to be sufficiently “opened up” to create a pattern that is both characteristic of natural occurrences, and would blend the 30ft corridor into the modified surrounding landscape. Within the ponderosa pine type vegetation, this could be possible by designing a project that would create open stands of varying sized openings and clusters of trees. This project design would mimic a ponderosa pine stand that has frequent fire occurrences that create an “open park-like stand”, where small shrubs and grasses occur on the forest floor. This type of project is consistent with SMS in that it addresses scenic stability issues making the pine stands more resistant to large stand replacement fire. Combined with the all of the recommended mitigation measures of transplanting within the construction zone(B,C, D) and leaving trees in zone E, this approach would screen parts of the contiguous 30ft opening from the viewer while blending the opening into the newly opened up timbered area, making the impacts visually subordinate to the characteristic landscape.

If this type of approach was included in the chosen alternative, then partial retention could be met as soon as soil color contrast mitigation was successful, and transplanted trees within the 75' corridor reached 20ft in height. The transplanted tree density would need to mimic the modified basal area of the surrounding area to blend the corridor into the landscape. Partial retention would not be met within the first year, but could eventually be met.



## PCGP Forest Service Visual Management Mitigation Analysis

These types of approaches were not addressed in the initial analysis, because it was considered beyond the limits of the project boundary. Whether that was an appropriate reason may be questionable but none the less it is why it was not included.

To be sure of achieving the required VQO, it is important to include measures such as:

- Replacement of trees that do not survive transplant
- Replacement of browsed shrubs
- Tilling, reseeding and mulching of areas where grasses do not take root

The survival rate of all transplanted and seeded plantings needs to be sufficient to meet the objectives of the mitigation. A survival rate of 70 percent should be achieved at the 5 year mark to ensure the success of the mitigations.

It is also important to use design features that address the larger project work, such as low cut stumps, slash treatment, skid trail treatments, etc. to ensure that these proposed methods do not compound the initial visual impacts.

## **Pacific Connector Gas Pipeline Project Visual Management Analysis Clarification**

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Donna M. Mattson  
Forest Landscape Architect  
February 17, 2009

### **Dead Indian Memorial Highway Crossing**

The forest plan standard for this area is Foreground Retention. This means that impacts are not visually evident from a foreground view.

The pipeline would have continued effects of a 30' overstory strip opening, meaning that for a distance of 600ft in one direction and 600ft in the other there will be an open sky strip. This is due to the removal of trees over 15ft and shrubs over 6ft. Because this strip is retained through out the existence of the pipeline in this location, retention would not ever be met; given the recommended mitigation measures within and along the edge of the ROW.

Granted this strip would be seen from a moving car only for a short period of time, but the Visual Management system does not address duration of the view of an impact, other than to consider duration in the scenic class inventory. Due to the sensitivity level of this road, along with the scenic attractiveness and viewed distance, this area was assigned a Retention VQO in the Forest Plan standards and guides.

The recommended visual mitigation calls for softening the strip effect by scalloping and feathering the edges (2.1 and 2.2). This would soften the effect but would not make the strip "not visually evident".

In order to meet retention, the strip effect must be addressed. Address meaning make it "not visually evident". To do this the surrounding timbered area would need to be sufficiently "opened up" to allow the open sky to be visible to the viewer traveling along this route, so that when the viewer drives by the crossing the open sky is not differing from the visual experience provided on either side of the crossing. So, this would be a designed project that would create a gradual thinning that increased the open sky view as the viewer approached the crossing point until the opening sky view was no longer a strip within a contiguous forest, but just an open sky view afforded to the viewer that does not appear unnatural in form, line, color, and texture. This is a project that could occur beyond the ROW, probably a ¼ to ½ mile each direction of the crossing point, and for a 600ft on both sides of the road. This kind of project could mimic a natural occurrence such as an insect and disease opening that often occurs in this lodge pole vegetation type. (Please validate with a silviculturist, ecologist, or entomologist) Over time this type of thinning would have to be maintained or the contiguous forest would "come back", and the strip over the pipeline would once again become visually evident. This type of treatment could also be considered in the form of a fuel break, which would be considered, within SMS appendix J an

action that could improve scenic stability by reducing the potential breadth of a stand replacement fire to a scale that is within the natural range of variability.

If this type of approach was included in the chosen alternative, then retention could be met as soon as soil color contrast mitigation was successful, and transplanted trees within the 75' corridor reached 20ft in height. The transplanted tree density would need to mimic the modified basal area of the surrounding area to blend the corridor into the landscape. Retention would not be met immediately nor within a year or one growing season, but it could eventually be met.

### **Clover Creek Road**

The forest plan standard for this area is foreground partial retention. This means that impacts “remain visually subordinate to the characteristic landscape”.

The continued removal of trees over 15ft and shrubs over 6ft within the immediate foreground of the Clover Creek Rd for the extended length of approximately 18 miles (8 miles being FS lands) would keep a 30ft corridor clear of vegetation less than 20ft in height. This is considered a linear corridor that is inconsistent with the characteristic landscape surrounding the project area. Because this strip is retained throughout the existence of the pipeline in this location, partial retention would not ever be met given the recommended mitigation measures within and along the edge of the ROW.

In order to meet partial retention, the corridor effect must be addressed. Address meaning make it “visually subordinate”. To do this the surrounding timbered area would need to be sufficiently “opened up” to a degree that the corridor no longer appears as a contiguous linear feature, but is more like openings that are consistent with those in the surrounding characteristic landscape. This means consistent in “size, amount, intensity, direction, pattern, etc.” Any introduced form, line, color, or texture that is introduced should remain subordinate to the visual strength of the characteristic landscape.”

To do this the surrounding timbered area would need to be sufficiently “opened up” to create a pattern that is both characteristic of natural occurrences, and would blend the 30ft corridor into the modified surrounding landscape. Within the ponderosa pine type vegetation, this could be possible by designing a project that would create open stands of varying sized openings and clusters of trees. This project design would mimic a ponderosa pine stand that has frequent fire occurrences that create an “open park-like stand”, where small shrubs and grasses occur on the forest floor. This type of project is consistent with SMS in that it addresses scenic stability issues making the pine stands more resistant to

large stand replacement fire. Combined with all of the recommended mitigation measures of transplanting within the construction zone (B, C, D) and leaving trees in zone E, this approach would screen parts of the contiguous 30ft opening from the viewer while blending the opening into the newly opened up timbered area, making the impacts visually subordinate to the characteristic landscape.

If this type of approach was included in the chosen alternative, then partial retention could be met as soon as soil color contrast mitigation was successful, and transplanted trees within the 75' corridor reached 20ft in height. The transplanted tree density would need to mimic the modified basal area of the surrounding area to blend the corridor into the landscape. Partial retention would not be met within the first year, but could eventually be met.

These types of approaches were not addressed in the initial analysis, because it was considered beyond the limits of the project boundary. Whether that was an appropriate reason may be questionable but none the less it is why it was not included.

To be sure of achieving the required VQO, it is important to include measures such as:

- Replacement of trees that do not survive transplant
- Replacement of browsed shrubs
- Tilling, reseeding and mulching of areas where grasses do not take root

The survival rate of all transplanted and seeded plantings needs to be sufficient to meet the objectives of the mitigation. A survival rate of 70 percent should be achieved at the 5 year mark to ensure the success of the mitigations.

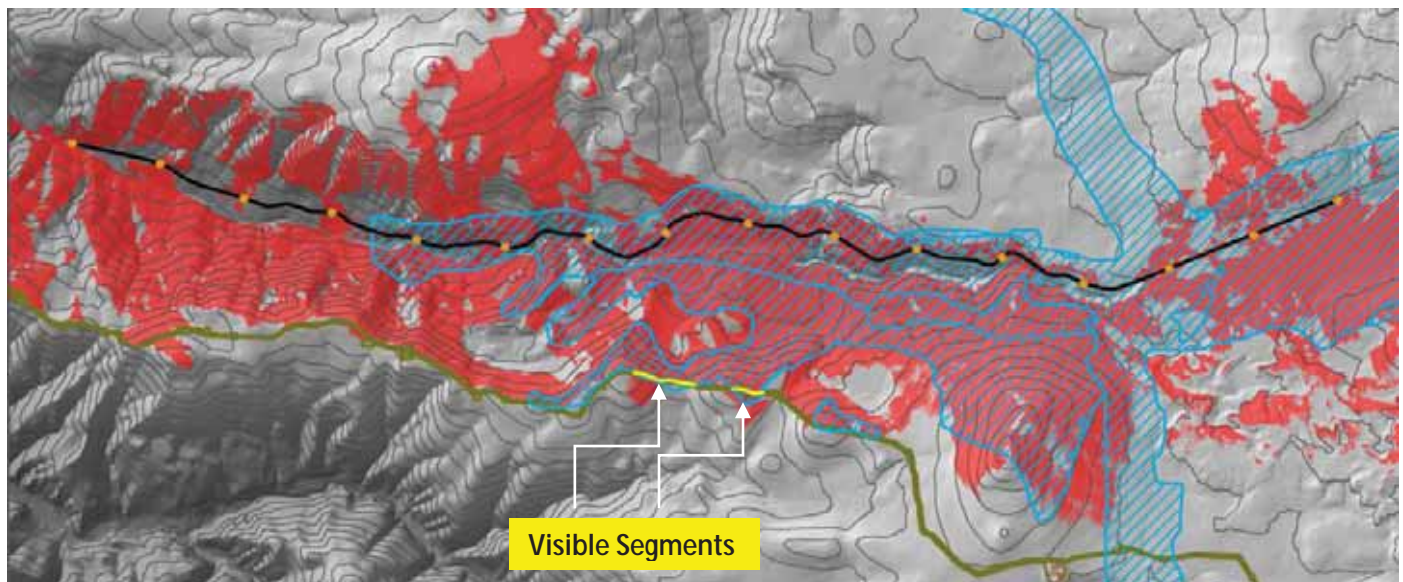
It is also important to use design features that address the larger project work, such as low cut stumps, slash treatment, skid trail treatments, etc. to ensure that our methods do not compound the initial visual impacts.





Resources to identify the ROW visibility from Hwy 140 (shown below in Figure 2). Via digital mapping a bare earth model was developed using digital elevations. The model is helpful in determining what areas are visible from the highway based on topography only. The visibility analysis below shows two segments (in yellow) that are visible. These segments correlate with my field work as being visible as well. (Segments 156.3-156.8, and 157.2-157.5) Although a bare earth analysis does not consider screening from vegetation, the result is similar to my findings in the field. The ground would not necessarily be visible, however what would be visible is the cut through the trees.

Figure 2 Visibility Analysis



Field work and Google Earth images confirm that these two segments are the only visible segments from Hwy 140. Upon further analysis it has been determined that some of the segments are not visible from Hwy 140 due to the location of the ROW related to the highway and the topography of the landscape between them.

The segments that were remaining in question are ***153.76 to 154.63, 155.80 to 155.82, 156.25 to 156.82 and 157.13 to 157.39.***

#### Segment MP 153.76 to 154.63

It appeared from satellite imagery and ROW maps that this segment could be visible from the highway looking southwest for a duration of approximately one mile. If this were the case, the ROW would not meet retention. The segment from ***MP 153.76 to MP 154.63*** of the ROW which lies within spotted owl habitat management area (Management Strategy 19). The visual quality objective for this area is retention; however this Standard & Guideline has been superseded in this case by the Northwest Forest Plan which makes the area a Late Successional Reserves. There is no stated visual quality objective for Late Successional Reserves. This means that maximum modification is allowable in this area. Having said that, it is still important to determine the impacts of the proposed ROW to the scenery resources as seen from the highway.

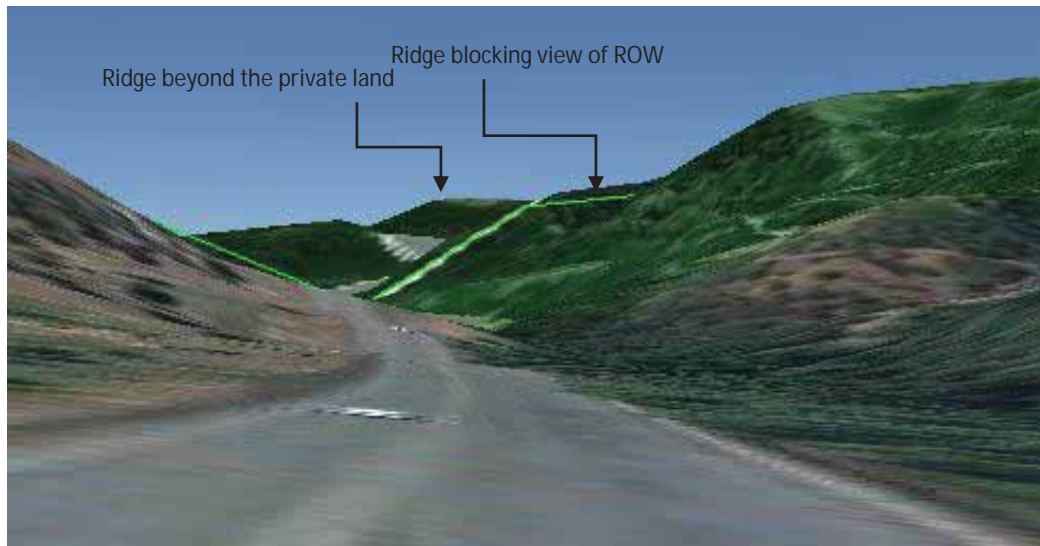
With the ROW draped over a Google Earth image, the visibility of the ROW was reviewed digitally and in the field. The onsite review in conjunction with a Google image review reveals that the segment in question is not visible from Hwy 140. It is screened by the ridge just west of the area. The angle of view from the Hwy coming from the west gives the viewer a long direct view which is aligned with the angle of the ROW. However, the long ridge coming off Heppsie Mountain, shown in the image below (Figure 3) obscures the ridge in question. The segment of the ROW is not visible from this angle nor is it visible from the east. Therefore, the visual impact of the ROW in this segment from Hwy 140 will meet retention.

Figure 3 MP 153.76 to MP 154.63 displayed via Google Earth



The photos taken in the field of this segment were actually taken of the ridge east of the private land segment shown in gray. That segment is discussed further in this document. The Google earth image below shows the layout of the landscape as viewed from Hwy 140. The green line is the FS boundary, and the gray area private land.

Figure 4 Google Earth view from Hwy 140



The segment **153.76 to 154.63** is screened from view by the ridge directly west.

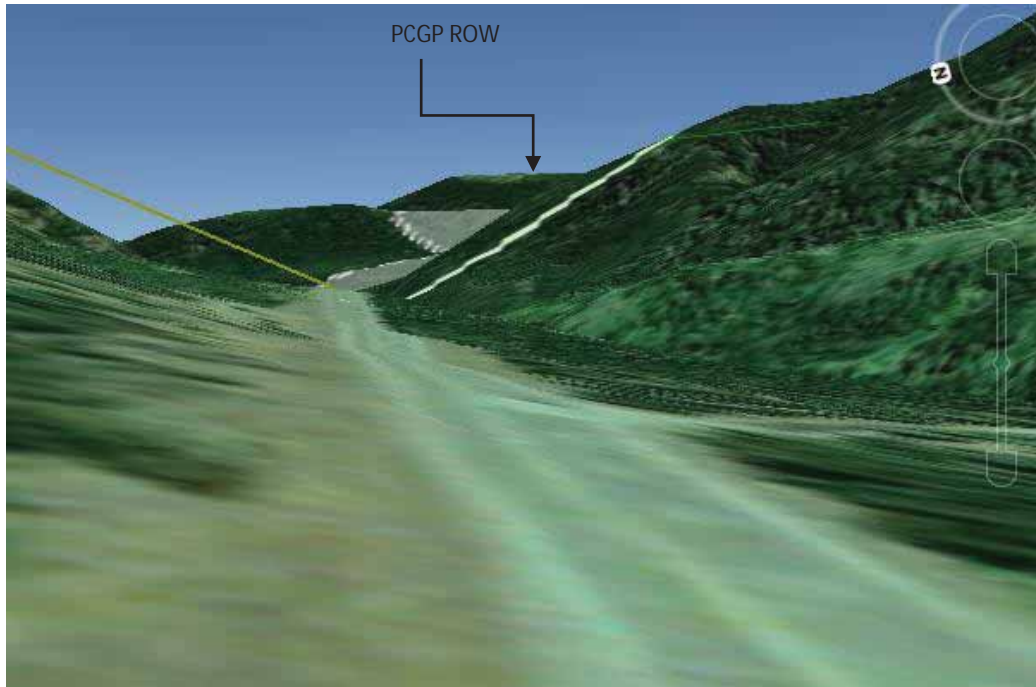
The view from Hwy 140 looks up toward the ridge top from the platform which is below the ridge so the crest of the ridge often blocks the view of the ROW. However, in some cases, from a distant and oblique view the ROW is visible. In other cases the oblique views are blocked by vertical ridges that lie somewhat perpendicular to the angle of view as in the case of the segment **155.80 to 156.20**.

#### Segment 155.80 to 155.20

The remaining segment in question is section that lies with **155.80 to 156.20**. By using Google Earth and viewing the area in the field, it has been determined that this segment is not visible from Hwy 140. The view from the Hwy 140 is an upward angle to the crest of the ridge that is 3.5 to 4 miles away. From a Google Earth image it appears that there is potential for clearing impacts of the ROW to be slightly visible from the Highway. However, the route is not aligned with the angle of sight which was an initial concern, nor does the Google image display any vegetation height that could screen the project impacts. The ROW traverses the slope at an oblique angle from the line of sight and appears to be 200'-400' behind the crest of the ridge.



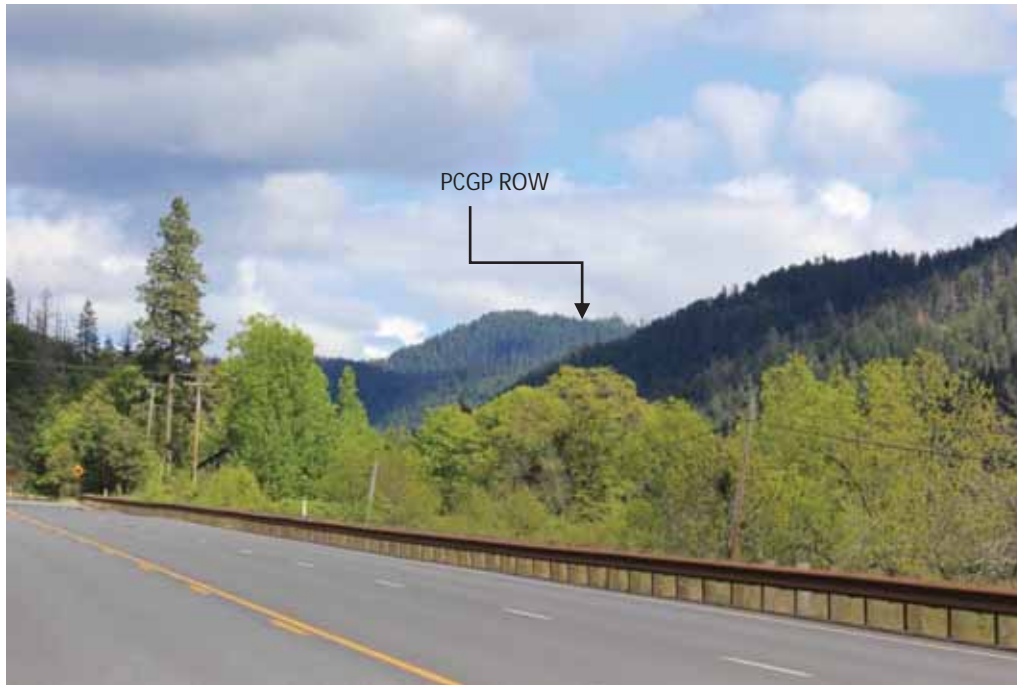
Figure 5 View from Hwy 140 via Google Earth as taken from photo point



This image above (Figure 3) shows the ROW showing up on the ridge to the east of the private land which is shown in gray with the sketchy white border. The visual quality objective of this area is partial retention from the crest of the ridge down toward the highway. It appears that the ROW is back from the crest, outside of partial retention, and would not be visible.

The photo below (Figure 4) shows the ridge on which the ROW would lie. The ROW, as shown in Figure 5; lies a distance ranging from 200 to 400 feet behind (south) of the crest of the ridge. This location of the ROW would allow enough room to leave an adequate screen of timber. It is expected that if this screening were retained the ROW would not be visible from Hwy 140.

Figure 6 Views from Hwy 140



View to ROW from Hwy 140 (42°23,786, 122°30,534)

The following images (Figure 7 and 8) show the location of the ROW along the ridge tops via Google Earth between **155.80 to 156.20**. The visibility of the ROW is determined by the line of sight from the view platform being Hwy 140. Therefore, if the crest of the ridge is in front of and between the viewer and the ROW then the line of sight is stopped or broken, and the ROW is not visible. It is recommended that the ROW be located as far to the south on this ridge as possible.

Figure 7 Google Earth Image showing distance from crest of the ridge



Figure 8 Google Earth image from 5284 ft elev.



This Google Earth image above (Figure 8) shows the location of the ROW being south of the top of the ridge as viewed from an elevation of 5248ft. The viewer on Hwy 140 is at an elevation of approximately 2545ft.

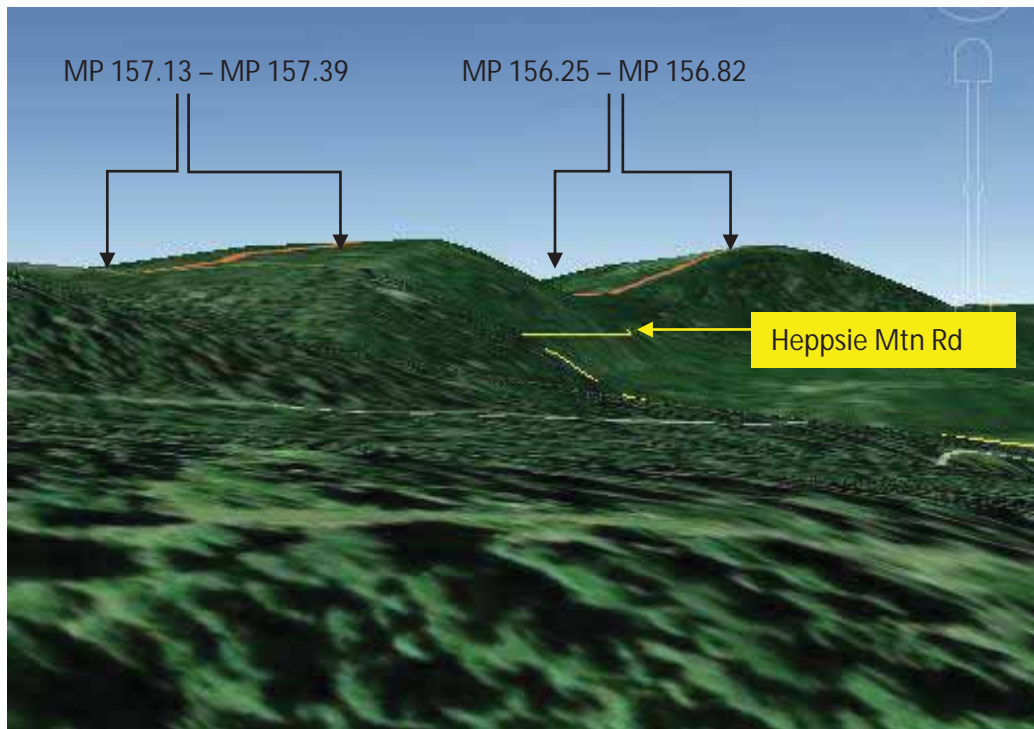
The Google Earth image above (Figure 8) shows the ROW just south of the ridge crest which is outside the view from Hwy 140. This segment would meet Partial Retention because it would be screened by the existing timber between the ROW and the crest of the ridge.

#### **Segment 156.25 to 156.82 and 157.13 to 157.39**

The segment **156.25 to 156.82** is located within a partial retention VOO. This segment would be visible from Hwy 140. The images below (Figure 9 & 10) show the ROW on a Google earth image and a similar view from a photo point located on the shoulder of Hwy 140. It is predicted that the visual impacts of the proposed ROW would create the equivalent of unacceptable modification at the point of project completion, (construction completed). The restoration efforts including revegetation within the 95ft ROW will eventually reduce the visual impact of the pipeline corridor. The timber on the northern edge of the ROW will eventually screen a majority of the pipeline corridor. However, the timeframe in which the visual quality objective of partial retention is to be met is within one year. (pg. 32 Natl Forest Landscape Management, Vol. 2) The vegetation screening is not expected to be in place within one year. The timber would need to reach a height of approximately 20ft to effectively screen the corridor in a manner that would reduce the visual impact enough to meet partial retention. The remaining 30ft corridor which will be "kept void of trees to facilitate corrosion and leak surveys and protect the pipeline from root damage" (ECRP) would be significantly screened and from this angle would eventually meet partial retention. The remaining 30ft corridor would essentially appear as a "straight linear gap" from the treetops in front of the ROW to the treetops behind the ROW. It is my judgement that this linear feature would be visually subordinate to the characteristic landscape.



Figure 9 Google Earth image of segments visible from Hwy 140



Segment **157.13 to 157.39** is also visible from Hwy 140 at an oblique angle. Prior to restoration it is expected that this segment would appear as a linear feature that would draw the eye to the area and thus the construction ROW is not expected to meet partial retention until timber in front of the 95 ft ROW reached a height of 20 feet in height whereas the remaining 30 foot corridor would be effectively screened. The remaining 30ft corridor is expected to meet partial retention due to screening of the trees to the north of the ROW. Once again, this achievement will not occur within one year of construction completion.

Figure 10 Segments Viewed from Hwy 140

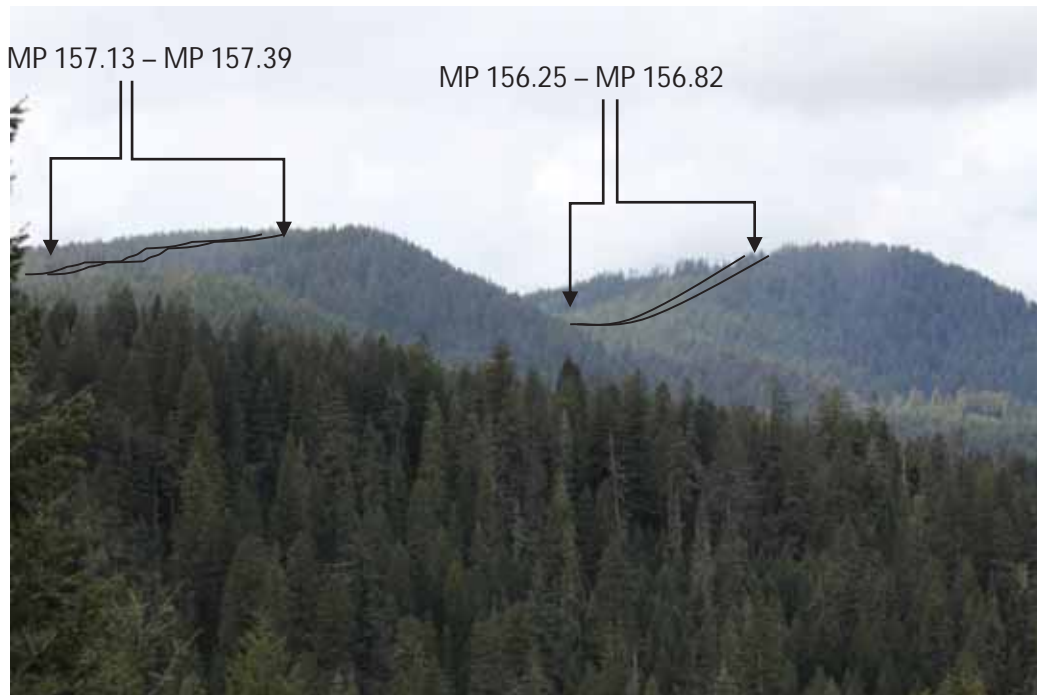


Photo taken from Hwy 140 (42° 23.204, 122°23.056)

All other segments are not expected to be visible from Hwy 140.

### Conclusion

Segments **153.76 to 154.63** and **155.80 to 156.20** of the proposed ROW are not expected to be visible from Hwy 140. Therefore, the project would meet the visual quality objectives assigned for those areas.

There are two segments (**156.25 to 156.82** and **157.13 to 157.39**) of the proposed ROW expected to be visible as shown above. These two segments lie within an area of partial retention. Partial retention is not expected to be achieved within one year of project completion. Restoration efforts are expected to eventually achieve partial retention but not within a one year period. These segments will require a site specific Forest Plan amendment for the duration in which it is necessary for restoration efforts to effectively screen the pipeline corridor.

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## **Appendix R-2**

### **Analysis of Potential Impacts to Wilderness, Inventoried Roadless Areas, Potential Wilderness Areas and Other Undeveloped Areas from the Construction and Operation of the Proposed PCGP Project, Umpqua, Rogue River, and Winema National Forests**

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Jordan Cove Natural Gas Liquefaction and  
Pacific Connector Gas Pipeline Project

**Final EIS**

**Appendix R-2**

**Analysis of Potential Impacts to Wilderness, Inventoried Roadless  
Areas, Potential Wilderness Areas and Other Undeveloped Areas from  
the Construction and Operation of the Proposed PCGP Project**

**Pacific Connector Gas Pipeline  
Umpqua, Rogue River, and Winema National Forests**

Prepared for:

**USDA Forest Service**

Prepared by:

**North State Resources**

**Final EIS**



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## **1.0 INTRODUCTION AND DEFINITION OF TERMS**

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This section describes and analyzes the effects of the PCGP project on the characteristics which define Wilderness areas, inventoried roadless areas (IRA), potential Wilderness areas (PWA) and other undeveloped areas on National Forest System Lands. This section also describes the step-by-step methods used to identify any PWA that could be impacted by the proposed PCGP Project.

Wilderness areas, IRAs and PWAs, are discussed together because they share a set of terminology and interrelated history. In contrast, a wide range of terms and references have been used by respondents, the courts, and the Forest Service when referring to topics such as roadless, unroaded, non-inventoried roadless, and undeveloped areas. The terms and definitions as stated below will be used in this site-specific analysis. They are based on current law, regulation, agency policy, and the Land and Resource Management Plans as amended, for the Umpqua, Rogue River, and Winema National Forests.

### **1.1 WILDERNESS**

A Wilderness area is designated by congressional action under the Wilderness Act of 1964 and other Wilderness acts. The Wilderness Act of 1964, Section 2(c) defines Wilderness, in part, as:

[A]n area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements of human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; ...

### **1.2 INVENTORIED ROADLESS AREAS**

IRAs were identified in the 2001 Roadless Area Conservation Rule in a set of inventoried roadless area maps, contained in the Forest Service Roadless Area Conservation Final Environmental Impact Statement, volume 2, dated November 2000, which are held at the National headquarters office of the Forest Service, or any subsequent update or revision of those maps (36 CFR 294.11). These areas were set aside through administrative rulemaking and have provisions, within the context of multiple use management, for the protection of IRAs.

### **1.3 POTENTIAL WILDERNESS AREAS**

This is not an official inventory. Official inventories of PWA areas are completed during forest planning. This document identifies PWAs only for purposes of assessing potential effects of the PCGP Project activities on Wilderness characteristics. PWAs are not a land designation decision (does not change current land management allocations), they do not imply or impart any particular level of management direction or protection, they are not an evaluation of potential Wilderness (FSH 1909.12, Chapter 72), and they are not preliminary administrative recommendations for Wilderness designation (FSH 1909.12, Chapter 73). The inventory of PWAs does not change the administrative boundary of any IRA or any congressionally designated Wilderness. The original designated management area (e.g., Matrix) would remain the land designation even if areas in the PCGP project planning area meet the handbook criteria

for PWA. PWAs are evaluated (in regard to making recommendations to Congress for inclusion in the National Wilderness Preservation System) during the development or revision of land management plans, in other words at the forest planning level and not at the project planning level.

PWAs qualify for placement on the inventory if they meet one or more of the following criteria

(FSH 1909.12, Chapter 71.1):

1. The area contains 5,000 acres or more.
2. Areas contain less than 5,000 acres, but can meet one or more of the following criteria:
  - a. Area can be preserved due to physical terrain and natural conditions.
  - b. Areas are self-contained ecosystems, such as an island, that can be effectively managed as a separate unit of the National Wilderness Preservation System.
  - c. Areas are contiguous to existing Wilderness, primitive areas, Administration endorsed Wilderness, or potential Wilderness in other Federal ownership, regardless of their size.
3. Areas do not contain forest roads (36 CFR 212.1) or other permanently authorized roads, except as permitted in areas east of the 100th meridian.

Areas may meet either criteria 1 and 3, or criteria 2 and 3. If the criteria in section 71.1 of FSH 1909.12 are met, criteria in section 71.11 of FSH 1909.12 (criteria for including improvements) must also be met. This analysis used the following project specific criteria to delineate areas characterized as undeveloped and roadless, yet included improvements:

- Roads (as defined in 36 CFR 212.1) were excluded per FSH 1909.12, section 71.1. Mapped areas were at least 300 feet from NFS roads. This distance was selected because tree harvest is commonly permitted within 300 feet of open forest roads for personal-use firewood. In addition, danger tree removal occurs at various distances from open forest roads depending on tree height, topographic slope, and other factors.
- Timber harvest areas where logging, as evidenced by stumps, and prior skid trails or roads are substantially unrecognizable, or areas where clearcuts have regenerated to the degree that canopy closure is similar to surrounding uncut areas per FSH 1909.12, section 71.11.

## **1.4 OTHER UNDEVELOPED AREAS**

Other undeveloped areas refer to those areas that do not meet inventory criteria as PWAs, and are not an IRA or designated Wilderness area. There are no forest-wide or management area standards and guidelines specific to other undeveloped areas in the Umpqua, Rogue River and Winema NF LMPs. All lands, including undeveloped areas, are managed consistent with forest-wide standards and guidelines and by designated LMP management area allocations. Other undeveloped areas are identified because they may contain special resource values that warrant an evaluation differently than other parts of the project area.



## 2.0 METHODOLOGY

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The analysis for PWAs within the PCGP Project area was conducted through a series of GIS map making, a review of aerial photography, and the use of professional judgment. The methodology utilized the application of specific PWA inventory criteria (described in Section 1 above). For each national forest crossed by the proposed PCGP Project the first step was to define the analysis area for identifying any PWAs that could be impacted by the PCGP Project. The analysis area included the consideration of any other adjacent federal lands (e.g. BLM lands).<sup>1</sup> The second step applied GIS map layers to each analysis area depicting the proposed pipeline corridor, existing Wilderness and IRAs, and the existing system roads on Federal lands.<sup>2</sup>

Forest roads have associated permitted uses and maintenance activities which have removed trees and created visible stumps within the road corridor. During initial road construction trees were felled within a clearing limit to provide for safe and efficient construction. Past clearing of trees along forest roads created stumps that are evident and recognizable. Road maintenance occurs to varying degrees along each road according to an assigned maintenance level and available funding. Road maintenance includes the periodic clearing of brush and falling of danger trees that present a hazard to forest visitors, employees, and contractors. Past removal of danger trees along forest roads created stumps that are evident and recognizable. Personal-use firewood gathering is generally permitted within 300 feet of open forest roads consistent with project NEPA decisions and motorized travel and access management plan decisions. Past firewood gathering along open forest roads created stumps that are evident and recognizable. Based on local knowledge, and professional judgment regarding the evidence of recognizable stumps, skid trails, etc. which occur to varying degrees adjacent to forest roads, and to facilitate easy on-the-ground identification of a uniform, measurable boundary along a semi-permanent, human-made feature, the boundary was set at 300 feet on each side of forest roads.

Step 3 consisted of utilizing aerial photography of each analysis area to evaluate other man-made improvements such as timber harvest areas.<sup>3</sup> Step 4 consisted of identifying any resulting undeveloped areas that would be impacted by the PCGP Project and meet the criteria for PWA. The Forest Service used professional judgment and local knowledge regarding any unique, site-specific conditions of each area being considered for placement on the inventory of potential Wilderness.

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<sup>1</sup> FSH 1909.12 section 71.1 directs the Forest Service when identifying PWAs to consider areas that are contiguous to existing Wilderness, primitive areas, Administration endorsed Wilderness, or potential Wilderness in other Federal ownership. There are BLM lands adjacent to these areas of the Umpqua, Rogue River, and Winema NFs. In the fall of 2012 the BLM updated its inventory of lands with wilderness character. These updates were part of the Analysis of the Management Situation process associated with the proposed revisions of BLM LMPs for Western Oregon. The results of this most recent inventory were compared to the proposed pipeline route and no areas of overlap were discovered. The adjacent BLM lands along the proposed route of the PCGP Project have been evaluated and were found to not have Wilderness character. There are no other adjacent Federal lands. Therefore there are no contiguous potential Wilderness areas in other Federal ownership along the proposed PCGP route.

<sup>2</sup> The current travel management plans for each Forest were used to identify the roads on the transportation system. In some areas there may be older roads that are no longer on the transportation system but may still be identifiable on the ground.

<sup>3</sup> Timber harvest areas were identified by locating the most visible and recognizable areas using aerial photographs (dating as far back as 1994), and generally represent the more recent or clear-cut harvested areas. Past human activities in these areas are easily recognized by stumps, skid trails, and landing areas. Older or less identifiable harvested areas based on aerial photography are not included here and as a result the amount of past timber harvesting in these areas may be underestimated.

## **3.0 ANALYSIS**

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### **3.1 UMPQUA NATIONAL FOREST**

This section discusses the PWA analysis in relation to the PCGP Project on the Umpqua NF. Figure 3-1 displays the area of analysis and the location of the pipeline corridor, existing roads, and any existing Wilderness or IRAs. The analysis area is a logical portion of the Umpqua NF in relation to the proposed PCGP project and extends to the Forest boundary to the North, South, and West of the PCGP Project and to areas of non-federal lands to the East.

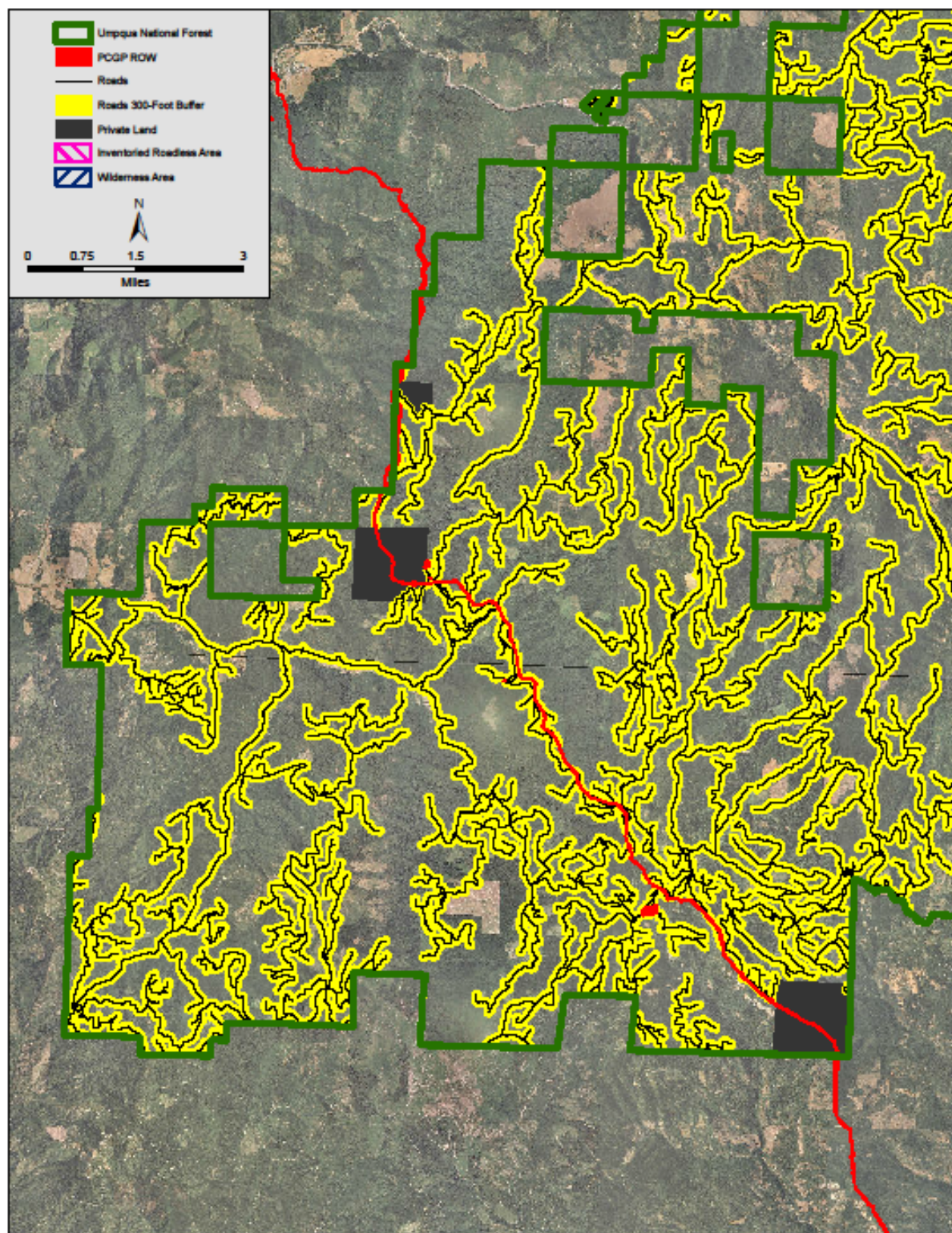
The map in figure 3-1 demonstrates the proposed PCGP Project would generally follow existing roads through the Umpqua NF with the exception of one short section (less than 1/2 mile long) in the north end of the project area within the Umpqua NF. This area is the only occurrence on the Umpqua NF where the proposed pipeline would impact an area that is relatively undeveloped. The undeveloped area polygon that would be affected by the proposed PCGP Project is displayed in figure 3-2 along with past timber harvesting areas as evidenced by aerial photography. This short section of proposed pipeline construction is at the far western edge of the polygon near the Forest boundary.

Undeveloped area Polygon #1 on the Umpqua NF is 1,792 acres in size. Because this undeveloped area is less than 5,000 acres in size it does not meet PWA criteria #1. This area also does not meet criteria #2 for PWA less than 5,000 acres in size [FSH 1909.12, section 71.1(2)] for the following reasons. Using local knowledge and professional judgment, this area is not an area that can be preserved due to physical terrain or natural conditions. The boundaries of this undeveloped polygon traverses varied terrain and portions are bounded by private property lines that do not follow physical terrain features or natural conditions. This area is also not a self-contained ecosystem, and is not contiguous to existing Wilderness or IRAs, or potential Wilderness in other Federal ownership.

### **3.2 ROGUE RIVER NATIONAL FOREST**

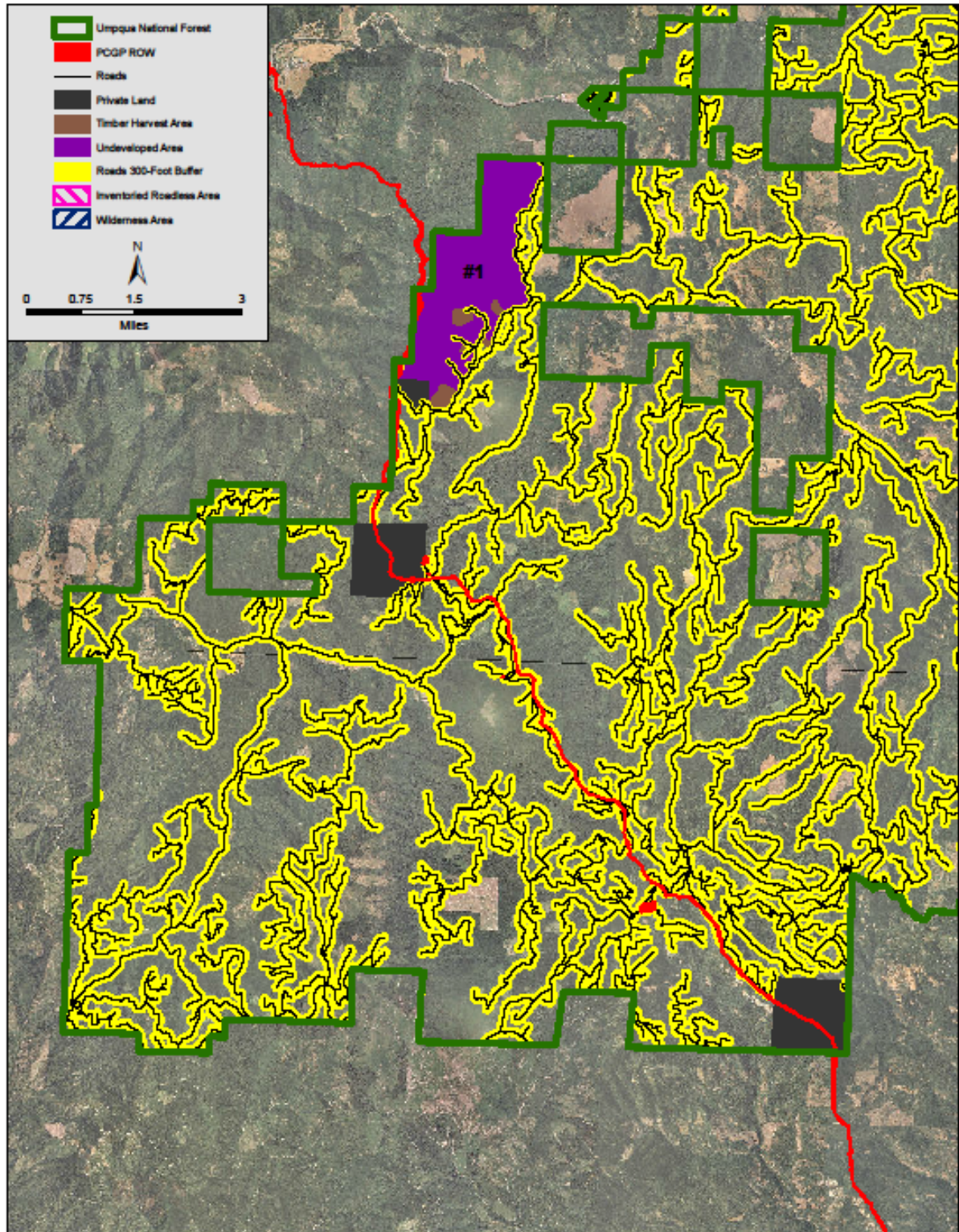
This section discusses the PWA analysis in relation to the PCGP Project on the Rogue River NF. Figure 3-3 displays the area of analysis and the location of the pipeline corridor, existing roads, and any existing Wilderness or IRAs. The analysis area is a logical portion of the Rogue River NF in relation to the proposed PCGP project and extends to the Forest boundary to the East, South, and West of the PCGP Project and to the IRA and Wilderness to the North.

The map in figure 3-3 demonstrates the proposed PCGP Project generally follows or is near existing roads with the exception of one short section (approximately 1.5 miles long) at the west end of the project area within the Rogue River NF. This area is the only occurrence on the Rogue River NF where the proposed pipeline would impact an area that is relatively undeveloped. This undeveloped area polygon is displayed in Figure 3-4 along with past timber harvesting areas as evidenced by aerial photography. The other areas impacted by the proposed project in the Rogue River NF present a landscape that has been managed and is developed in nature due to the road system density and past timber harvest activities (see figure 3-4).



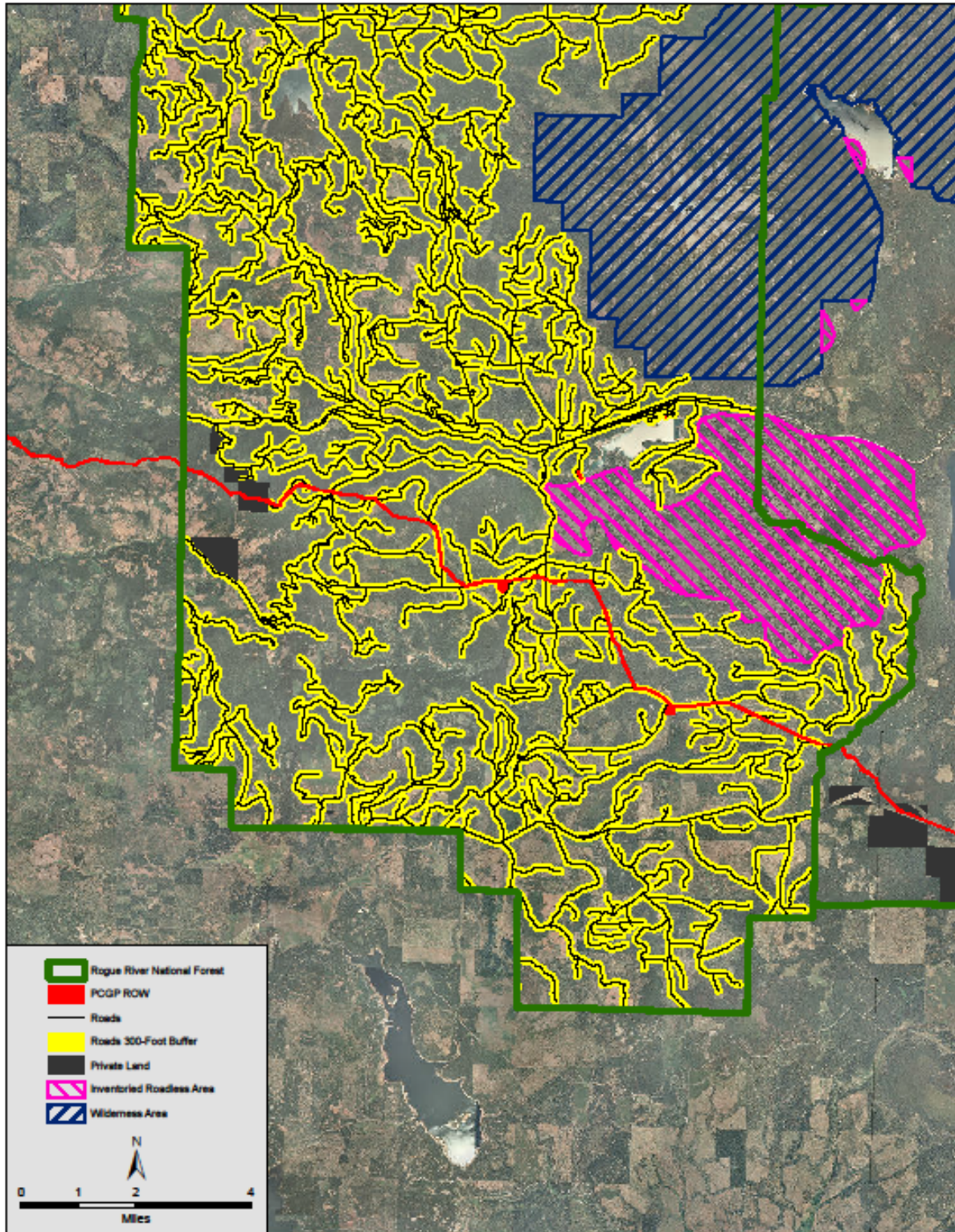
**Figure 3-1. Map of roaded areas in relation to the PCGP Project on the Umpqua NF**





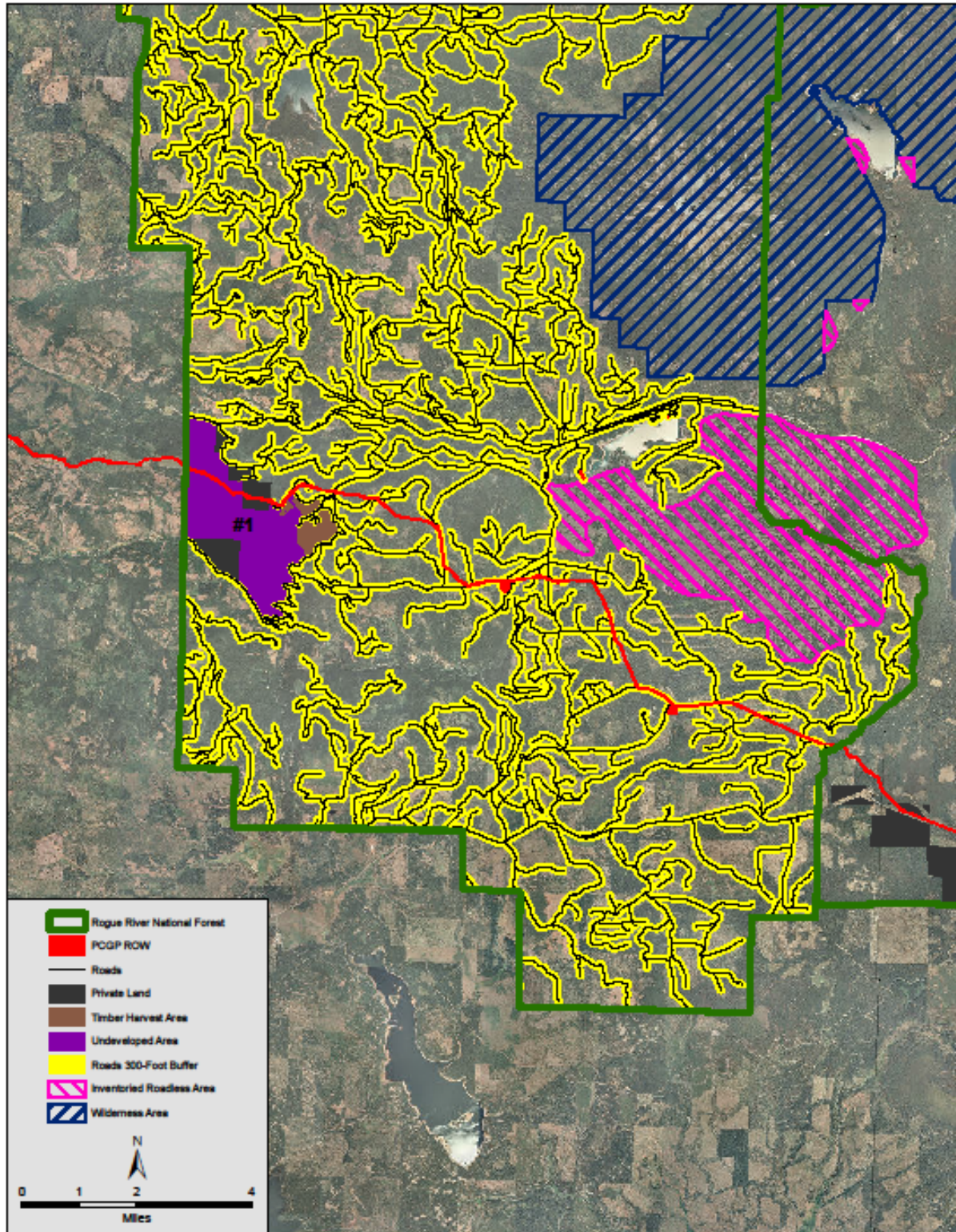
**Figure 3-2. Map of other undeveloped areas and the PCGP Project on the Umpqua NF**





**Figure 3-3. Map of roaded areas in relation to the PCGP Project on the Rogue River NF**





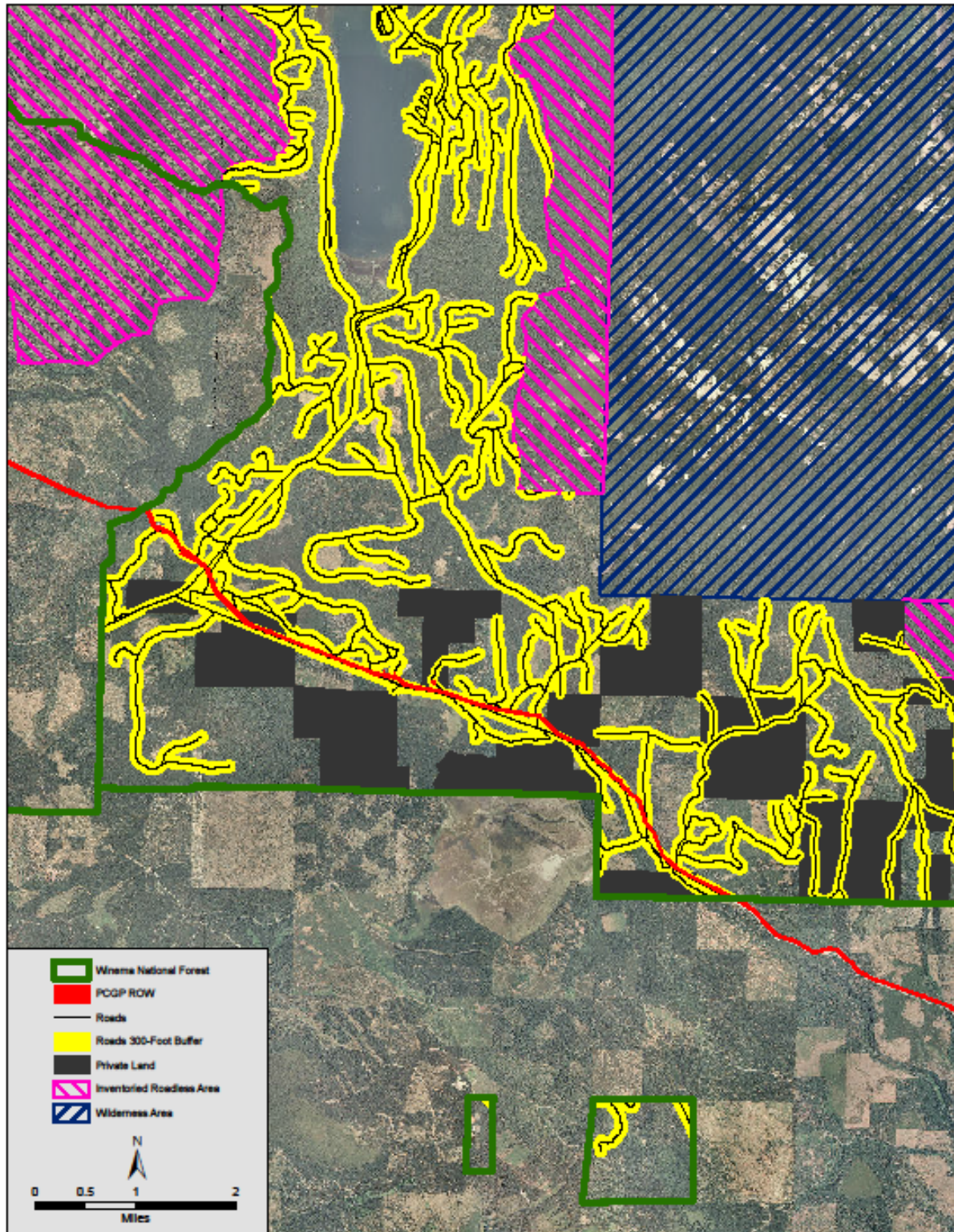
**Figure 3-4. Map of other undeveloped areas and the PCGP Project on the Rogue River NF**



Undeveloped area Polygon #1 on the Rogue River NF is 1,955 acres in size. Because this undeveloped area is less than 5,000 acres in size it does not meet PWA criteria #1. This area also does not meet criteria #2 for PWA less than 5,000 acres in size [FSH 1909.12, section 71.1(2)] for the following reasons. Using local knowledge and professional judgment, this area is not an area that can be preserved due to physical terrain or natural conditions. The boundaries of this undeveloped polygon traverses varied terrain and portions are bounded by private property lines that do not follow physical terrain features or natural conditions. This area is also not a self-contained ecosystem, and is not contiguous to existing Wilderness or IRAs, or potential Wilderness in other Federal ownership.

### **3.3 WINEMA NATIONAL FOREST**

This section discusses the PWA analysis in relation to the PCGP Project on the Winema NF. Figure 3-5 displays the area of analysis and the location of the pipeline corridor, existing roads, and any existing Wilderness or IRAs. The analysis area is a logical portion of the Winema NF in relation to the proposed PCGP project and the Forest boundary. There were no undeveloped lands in this area on the adjacent Rogue River NF (see figure 3-4 above). Figure 3-5 demonstrates that the proposed PCGP Project would follow existing roads through the Winema NF and there would be no undeveloped areas affected.



**Figure 3-5. Map of roaded areas in relation to the PCGP Project on the Winema NF**

## **4.0 EVALUATION OF EFFECTS**

---

### **4.1 WILDERNESS**

#### **4.1.1 Existing Condition**

Two Wilderness Areas are in proximity to the proposed PCGP alignment; Sky Lakes Wilderness (113,590 acres) is in both the Winema and Rogue River National Forests and its southern tip is approximately 3.7 miles north of the pipeline alignment at MP 162.0; and Mountain Lakes Wilderness (23,071 acres), in the Winema National Forest, is approximately 2.3 miles north of MP 173.0 (see figures 3-3 and 3-5 above).

#### **4.1.2 Environmental Effects**

No project activities would occur within or adjacent to a Wilderness area. There would be no effects on designated Wilderness or Wilderness characteristics because the closest Wilderness (Mountain Lakes) is over 2 miles away. Because of this distance, project activities would typically not be seen or heard by anyone recreating in the Wilderness. The exceptions could be short duration views of smoke during burning activities. Smoke management mitigation measures would minimize the risk of smoke drifting into the Wilderness.

### **4.2 INVENTORIED ROADLESS AREAS**

#### **4.2.1 Existing Condition**

The nearest IRA is the Brown Mountain IRA, located on the Rogue River National Forest approximately 0.6 mile north of MP 162.0. On the Winema National Forest, the West Boundary IRA is about 2.2 miles northeast of MP 172.2 (see figures 3-3 and 3-5 above).

#### **4.2.2 Environmental Effects**

No project activities would occur within or adjacent to an IRA. There would be no effects on IRAs.

### **4.3 POTENTIAL WILDERNESS AREAS**

#### **4.3.1 Existing Condition**

No undeveloped areas greater than 5000 acres would be crossed by the PCGP project on National Forest System Lands. All of the undeveloped areas crossed by the PCGP project are less than 5000 acres in size, are not contiguous to existing Wilderness or IRAs, and do not meet the PWA criteria for areas less than 5000 acres (see Section 3 above).

#### **4.3.2 Environmental Effects**

The PCGP project would not affect any PWA.

## 4.4 OTHER UNDEVELOPED AREAS

### 4.4.1 Existing Condition

There are approximately 3,747 acres of other undeveloped areas not meeting PWA criteria that would be crossed by the PCGP Project (see Section 3 above). Other undeveloped areas may have intrinsic ecological and social values because they do not contain roads (or the roads are no longer system roads) and evidence of past timber harvest. These values can include intrinsic physical and biological resources (soil, water, wildlife, recreation, fisheries, etc.), and intrinsic social values (apparent naturalness, solitude, remoteness).

Human influences have had limited impact to long-term ecological processes within these other undeveloped areas. Disturbance by insects and fire have likely been the factors with the most potential to have impacted the area. Opportunities for primitive recreation include camping, hiking, hunting, wildlife watching, and photography. Opportunities for a feeling of solitude, the spirit of adventure and awareness, serenity, and self-reliance are limited by the size and shape of the polygons. Distance to roads and topographic screening are also factors. The size of the area necessary to feel a sense of solitude varies by individual. However areas that are long and narrow offer less opportunity for solitude due to less distance from noise at their midpoint. Nearby sounds of roads and timber harvest can often be heard and sometimes seen from within these undeveloped areas because they are all within approximately one mile or less of the nearest road from their midpoints.

### 4.4.2 Environmental Effects

There are two “other undeveloped areas” that would be impacted by the PCGP Project on Forest Service lands. One is on the Umpqua NF and the other is on the Rogue River NF (see figures 3-2 and 3-4 above). Table 4.4.2-1 provides a summary of the undeveloped areas and the acres that would be impacted by the PCGP Project on National Forest System lands.

TABLE 4.4.2-1				
Summary of other undeveloped areas and acres impacted by the PCGP Project <u>a/</u>				
National Forest	Polygon #	Acres Undeveloped	Acres impacted by the PCGP Project	Acres Unchanged
Umpqua NF	1	1,792	20	1,772
Rogue River NF	1	1,955	22	1,933
Winema NF	None	0	0	0
<b>Totals</b>	<b>2</b>	<b>3,747</b>	<b>42</b>	<b>3,705</b>
<u>a/</u> Acres impacted include the pipeline corridor, temporary extra work areas, and acres used as un-cleared storage areas.				

### 4.4.3 Intrinsic physical and biological resources (soil, water, wildlife, recreation, fisheries, etc.)

For other undeveloped areas within the PCGP Project area where proposed pipeline construction and operation would occur, the impacts to soil, water quality, air quality, forage, plant and animal communities, habitat for threatened, endangered, and sensitive species, developed recreation, noxious weeds, and cultural resources, etc. are essentially the same as disclosed in Chapter 4 of the DEIS and are not reiterated here.

#### **4.4.4 Intrinsic social values (apparent naturalness, solitude, remoteness)**

The proposed PCGP Project would impact the apparent naturalness, and solitude within these areas. Pipeline construction would alter the apparent naturalness on approximately 42 acres of these other undeveloped areas. Pipeline construction would increase the number of visible stumps, and the linear nature of the pipeline corridor clearing would be the most apparent visual change resulting from implementation. The linear nature of the cleared corridor would likely adversely affect the visual recreational experience of anyone using this area for dispersed recreation. This impact would be long-term due to a portion of the ROW being maintained as a low vegetation area for the life of the project. Although the proposed pipeline construction and operation would adversely affect visual resources in these areas it would not be inconsistent with the standards and guidelines for visual quality in the respective LMPs.

The sounds, smells, and sights of mechanical activities associated with the construction of the pipeline in and adjacent to these other undeveloped areas would reduce the sense of solitude and remoteness during construction activities. Other sights and sounds of ongoing and previously approved activities in areas adjacent to these other undeveloped areas would continue to have short-term effects on opportunities for solitude and remoteness. Overall there would be little change to the current availability of solitude or primitive recreation within these areas because only a very small amount (about 1% percent) would be impacted by the proposed PCGP Project (see table 4-1 above).

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## **Appendix R-3**

### **Winter Range Standard and Guideline Compliance, Rogue River National Forest**

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# Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project

## **Final EIS**

### **Appendix R-3**

#### **Winter Range Standard and Guideline Compliance**

#### **Rogue River National Forest**

Prepared for:

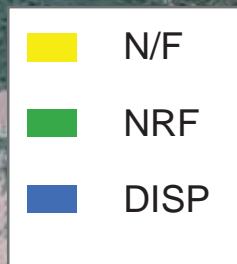
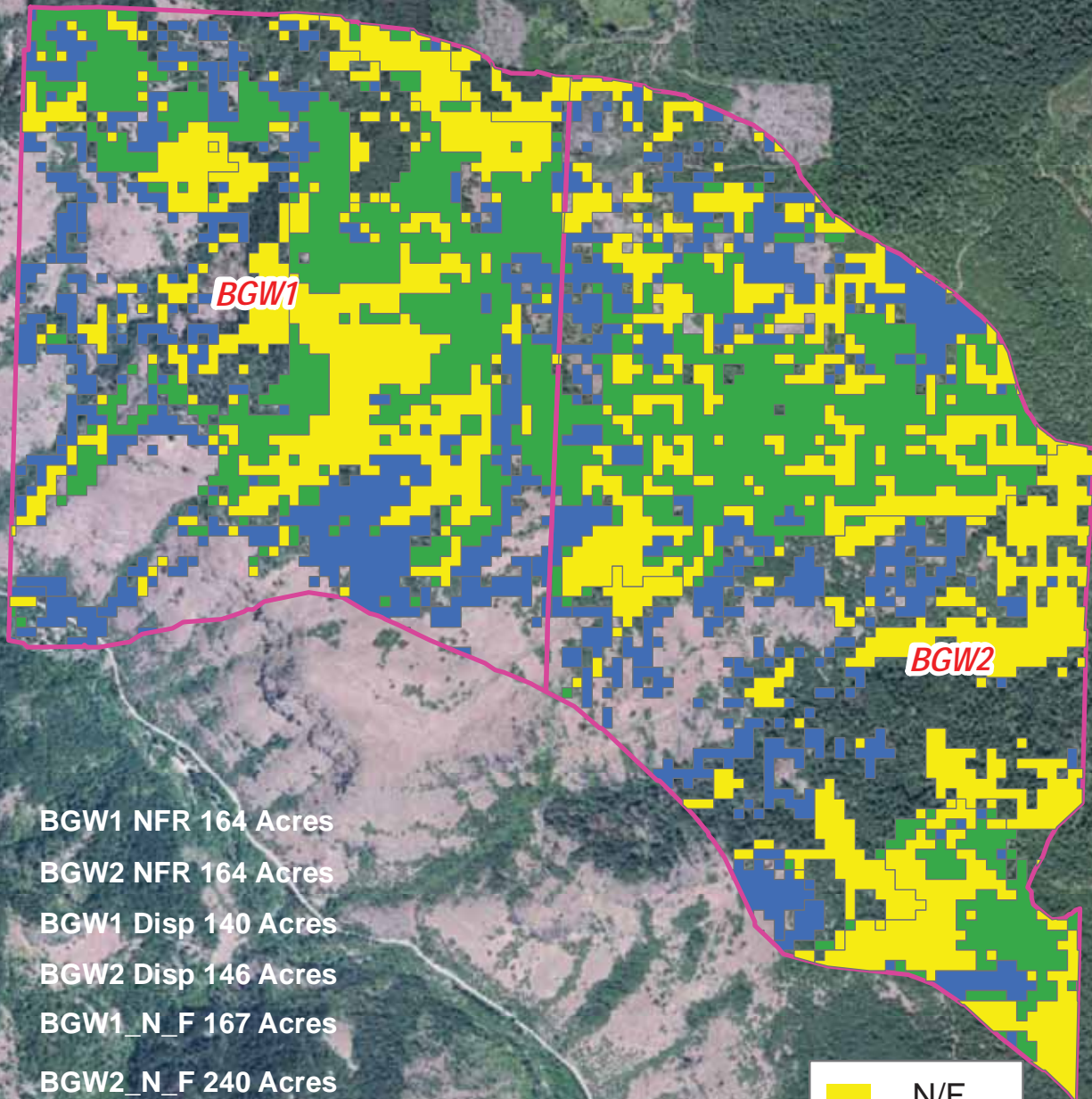
**USDA Forest Service**

Prepared by:

**North State Resources in Cooperation with RRNF**

**Final EIS**

Block 1 = 802 Acres  
Optimum Thermal Cover = 329 acres  
51% of Block 1 is Thermal Cover of which 80% is  
Optimum Thermal Cover  
Block 2 = 716 acres  
Optimum Thermal Cover = 402 Acres  
68% of Block 2 is Thermal Cover of which 83% is  
Optimum Thermal Cover.



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## **Appendix R-4**

### **Connectivity and Diversity Block Assessment, Coos Bay and Roseburg District BLM**

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# Pacific Connector Gas Pipeline Project

## Final EIS

### **Appendix R-4**

#### **Connectivity and Diversity Block Assessment**

#### **Coos Bay and Roseburg Districts**

#### **Bureau of Land Management**

Prepared for:

**Coos Bay and Roseburg Districts, BLM**

Prepared by:

**North State Resources**

<b>Summary Table – Effects of PCGP ROW on LSOG in Connectivity/Diversity Blocks</b>						
NSR Block No.	BLM Block No.	BLM Acres	Acres > 80 Years of Age	Acres > 80 Years of Age Removed by ROW	Resulting Acres > 80 Years of Age	Resulting % Acres > 80 Years of Age
1	1	621.20	489.47	1	488.47	78.6
3	3	218.80	218.80	3	215.80	98.6
4	12	882.82	382.76	4	378.76	42.9
5	11	1146.49	807.19	4	803.19	70.0
6	38	638.56	224.35	1	223.35	35.0
7	39	319.26	223.50	0	223.50	70.0

#### Connectivity and Diversity Assessment

#### Roseburg District, South River RA, Connectivity Blocks

Block #	Total Acres	>80 Acres	% >80
1	621.20	489.47	79%
2	292.12	229.82	79%
3	218.80	218.80	100%
4	709.42	300.86	42%
5	762.05	752.63	99%
6	519.48	297.93	57%
7	811.16	664.55	82%
8	694.40	507.99	73%
9	503.24	221.56	44%
10	731.17	607.04	83%
11	1146.49	807.19	70%
12	882.82	382.76	43%
13	1730.37	1302.02	75%
14	371.33	255.88	69%
15	835.94	363.99	44%
16	986.63	767.30	78%
17	528.68	379.24	72%
18	200.41	71.42	36%
19	623.86	204.75	33%
20	582.13	232.98	40%
21	610.93	255.95	42%
22	631.36	299.39	47%

23	639.45	310.70	49%
24	612.51	509.28	83%
25	581.63	349.00	60%
26	598.42	246.57	41%
27	644.85	228.23	35%
28	637.60	299.90	47%
29	640.13	218.66	34%
30	638.28	343.36	54%
31	657.07	253.13	39%
32	640.09	496.47	78%
33	684.64	617.13	90%
34	501.85	76.56	15%
35	598.94	101.43	17%
36	645.27	271.90	42%
37	597.79	325.92	55%
38	638.56	224.35	35%
39	319.26	223.50	70%
40	647.85	229.09	35%
41	632.87	513.48	81%
42	356.85	259.45	73%
43	566.82	244.16	43%
44	250.45	201.56	80%
45	466.06	316.80	68%
46	616.04	169.42	28%
47	691.81	433.81	63%
48	524.49	293.87	56%
49	611.08	339.42	56%
50	605.31	317.17	52%
51	339.72	306.97	90%
52	628.88	354.90	56%
53	661.54	447.41	68%
54	650.00	313.55	48%
55	307.09	199.25	65%
56	608.87	385.26	63%
57	629.24	502.71	80%
58	642.37	202.61	32%
59	633.07	468.31	74%
60	34.40	0.00	0%
61	152.65	74.10	49%
62	662.85	358.05	54%
63	399.72	218.41	55%
64	635.58	260.05	41%
65	317.77	203.78	64%
66	563.53	114.78	20%

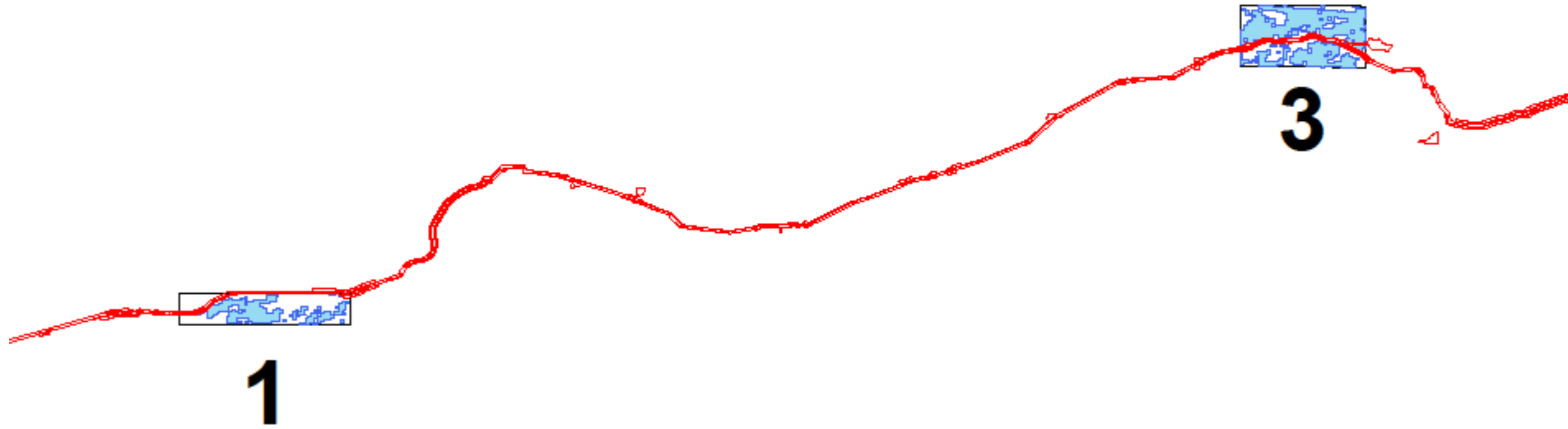
67	631.84	318.32	50%
68	637.44	330.29	52%
69	624.39	507.40	81%
70	643.32	335.92	52%
71	570.72	436.21	76%
72	587.45	206.28	35%

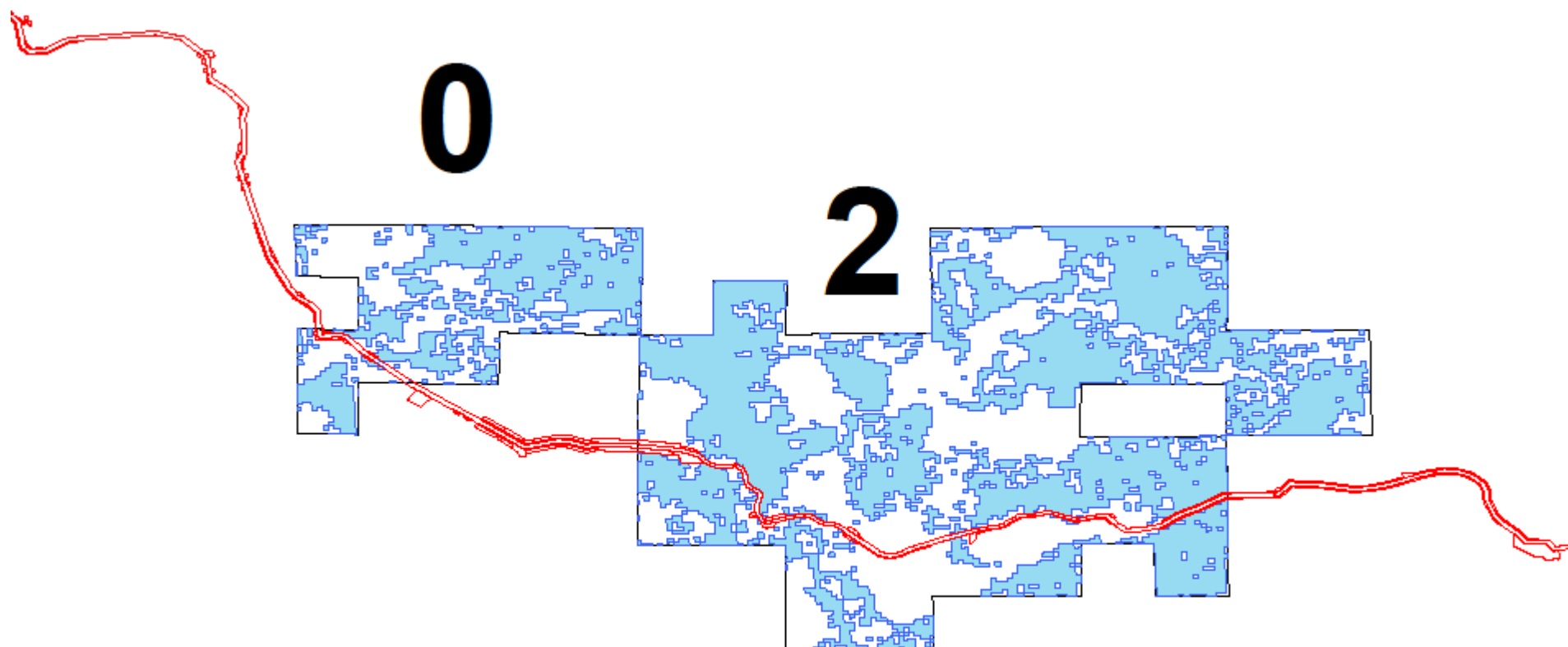
<b>totals</b>	<b>42,802.42</b>	<b>24,572.38</b>	<b>57%</b>
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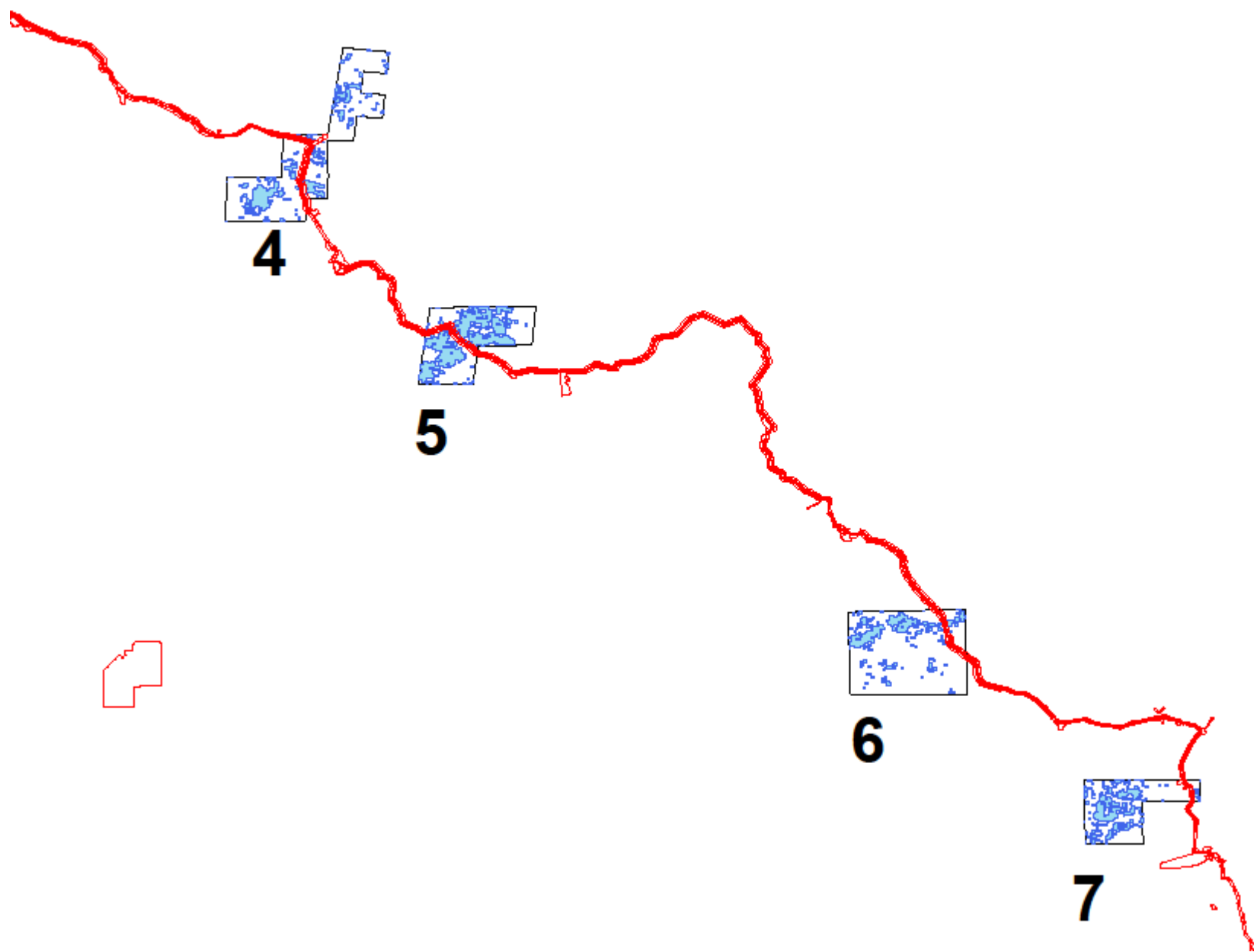
Coos Bay CD Blocks

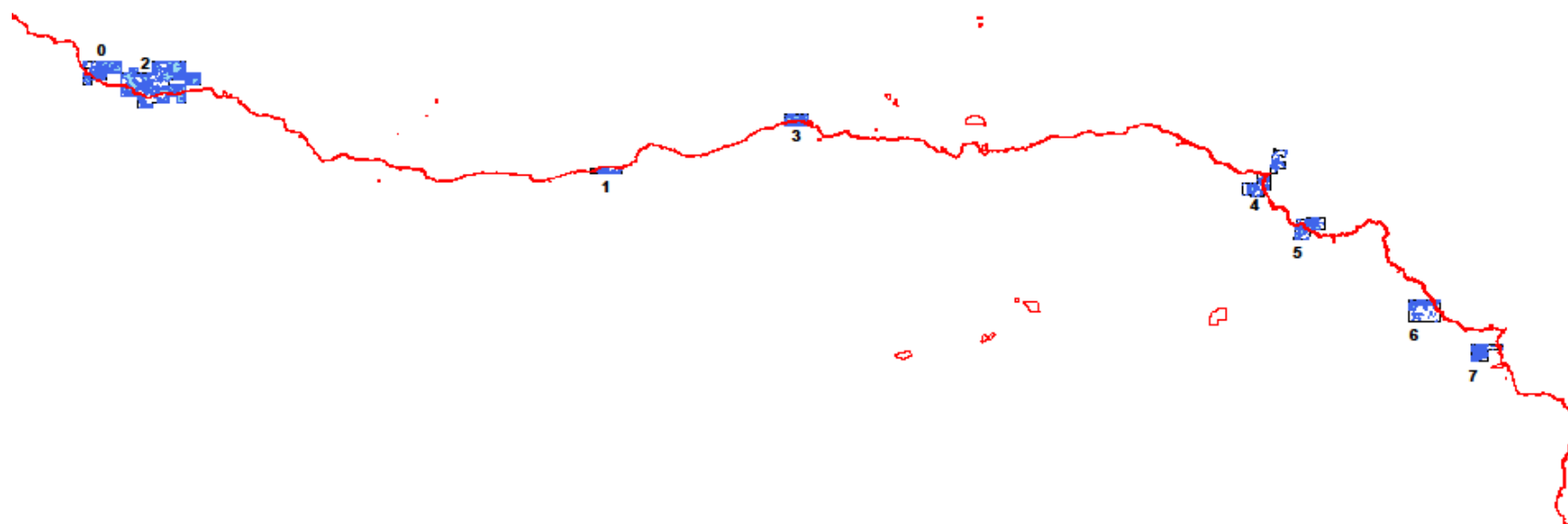
<u>Area</u>	<u>Area Acres</u>	<u>LSOG Acres (w/o ROW)</u>	<u>% LSOG by Area</u>	<u>LSOG Acres (w/ROW)</u>	<u>%LSOG w/ROW</u>
0	502	256	51%	254	51%
1	161	52	32%	51	32%
2	2069	1086	52%	1077	52%
3	235	141	60%	138	59%













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## **Appendix R-5**

### **Analysis of Bureau of Land Management Areas with Wilderness Characteristics**

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# Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project

## **Final** EIS

### Appendix R-5

#### **Analysis of Bureau of Land Management Areas with Wilderness Characteristics**

**Coos Bay, Roseburg, and Medford Districts and the Klamath Falls  
Resource Area of the Lakeview District, Bureau of Land Management**

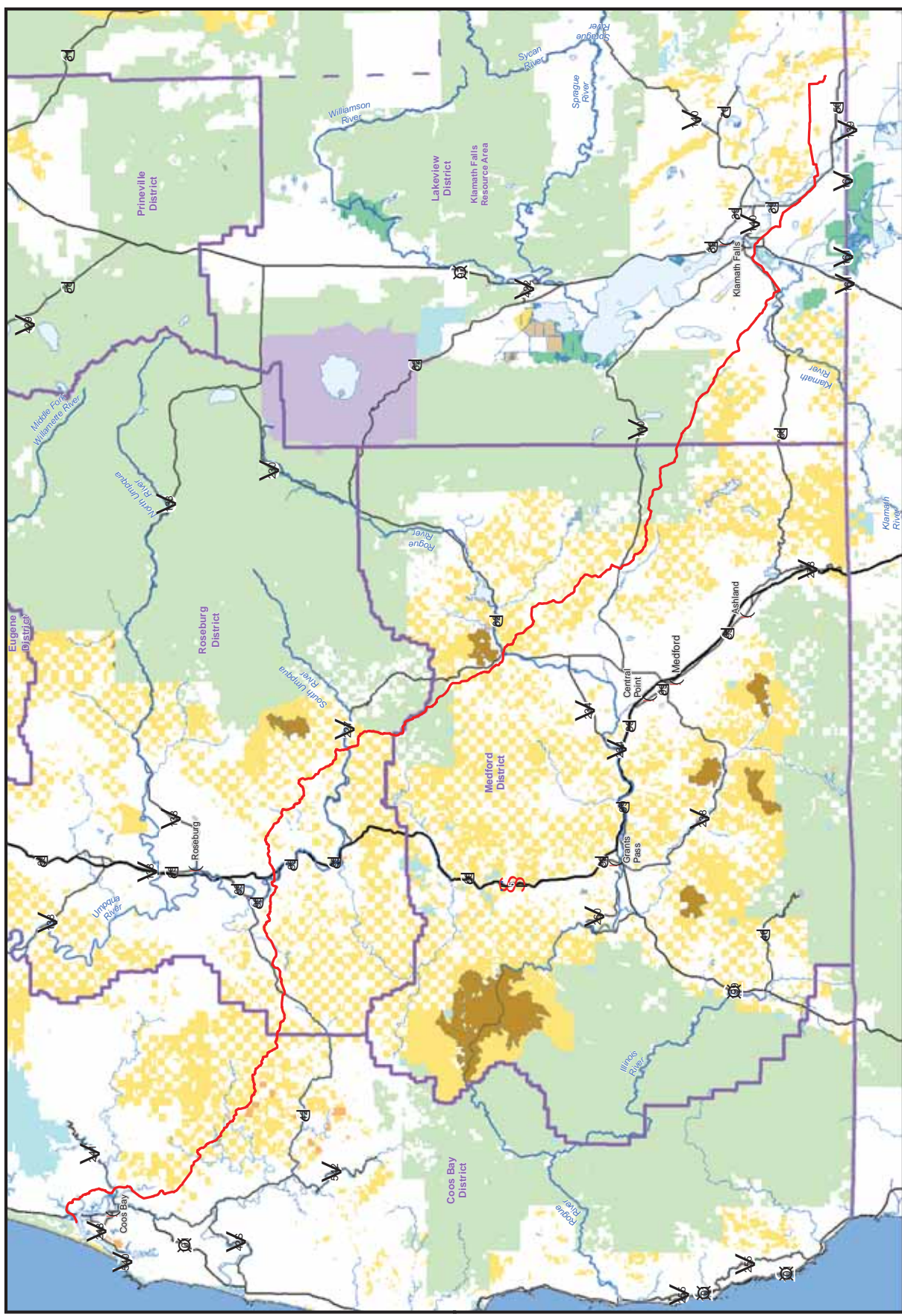
**Prepared By: Oregon State Office, BLM**

To Project Files

#### 4.7.4 BLM Lands with Wilderness Character

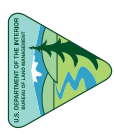
In the fall of 2012 the BLM updated its inventory of lands with wilderness character. These updates were part of the Analysis of the Management Situation process associated with the RMPs for Western Oregon. The inventory covered BLM managed lands in the Salem, Eugene, Roseburg, Coos Bay and Medford Districts and the Klamath Falls Resource Area of the Lakeview District.

The results of this most recent inventory were compared to the proposed pipeline route and no areas of overlap were discovered. Therefore the proposed PCGP is not anticipated to impact land with wilderness character.

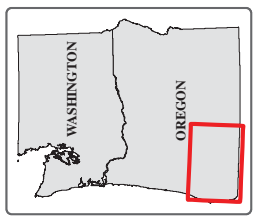


# Legend

- ( Cities and Towns
- PCGP Proposed Route 2012
- Wilderness Characteristics
- District Area Boundaries
- Bureau of Land Management
- U.S. Forest Service
- National Park Service
- U.S. Fish and Wildlife Service
- Bureau of Indian Affairs
- Other Federal
- State
- Local Government
- Private/Unknown



For internal use only.



No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of this data for individual or aggregate use with other data.

## Wilderness Characteristics and PCGP

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## **Appendix R-6**

### **Consistency Determination, Pacific Connector Gas Pipeline Project and Upper Rock Creek Area of Critical Environmental Concern**

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# Jordan Cove Natural Gas Liquefaction and Pacific Connector Gas Pipeline Project

## **Final** EIS

### Appendix R-6

#### **Consistency Determination, Pacific Connector Gas Pipeline Project and Upper Rock Creek Area of Critical Environmental Concern**

#### **Pacific Connector Gas Pipeline**

#### **Coos Bay District BLM**





## United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Coos Bay District Office

1300 Airport Lane, North Bend, OR 97459

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Telephone: (541) 756-0100 Toll Free: (888) 809-0839 Fax: (541) 751-4303



IN REPLY REFER TO

2880 (ORC000)

OR 63542

To: Note to Official File

From: Patricia Burke, District Manager, Coos Bay District BLM

Subject: Consistency determination between Pacific Connector pipeline project and Upper Rock Creek Area of Critical Environmental Concern.

The proposed Pacific Connector Gas Pipeline would cross the extreme southwest corner of the Rock Creek Area of Critical Environmental Concern (ACEC). Pacific Connector provided an assessment of impacts in the Rock Creek ACEC in their Plan of Development (POD) dated January 2013. In their review, Pacific Connector concluded that the values for which the ACEC was established would not be affected by the PCGP if it is constructed.

This 472-acre ACEC located in Section 5 of T. 29 S., R. 9 W. was designated to maintain, protect, and restore Relevant and Important values of the area's natural systems and botanical values which include approximately 300+ year-old western red cedar and western hemlock (approximate birthdate c. 1700), and skunk cabbage as well as sedge-dominated wetlands.

Approximately 1.1 acres of 40 year-old regenerating forest on the southwest corner of the ACEC would be affected by the PCGP if constructed. Based on a review of records for this ACEC, the area affected was not originally part of the ACEC because it was younger, regenerating forest and did not contain the Relevant and Important values found in the older forest / wetland areas. The boundary was later moved to the Rock Creek Road presumably to provide for simpler administration and mapping of the area. This boundary change added the area impacted by the PCGP to the ACEC. Since the affected area is a young, planted forest resulting from past timber harvest, the affected area does not contain the R&I values for which the ACEC was established.

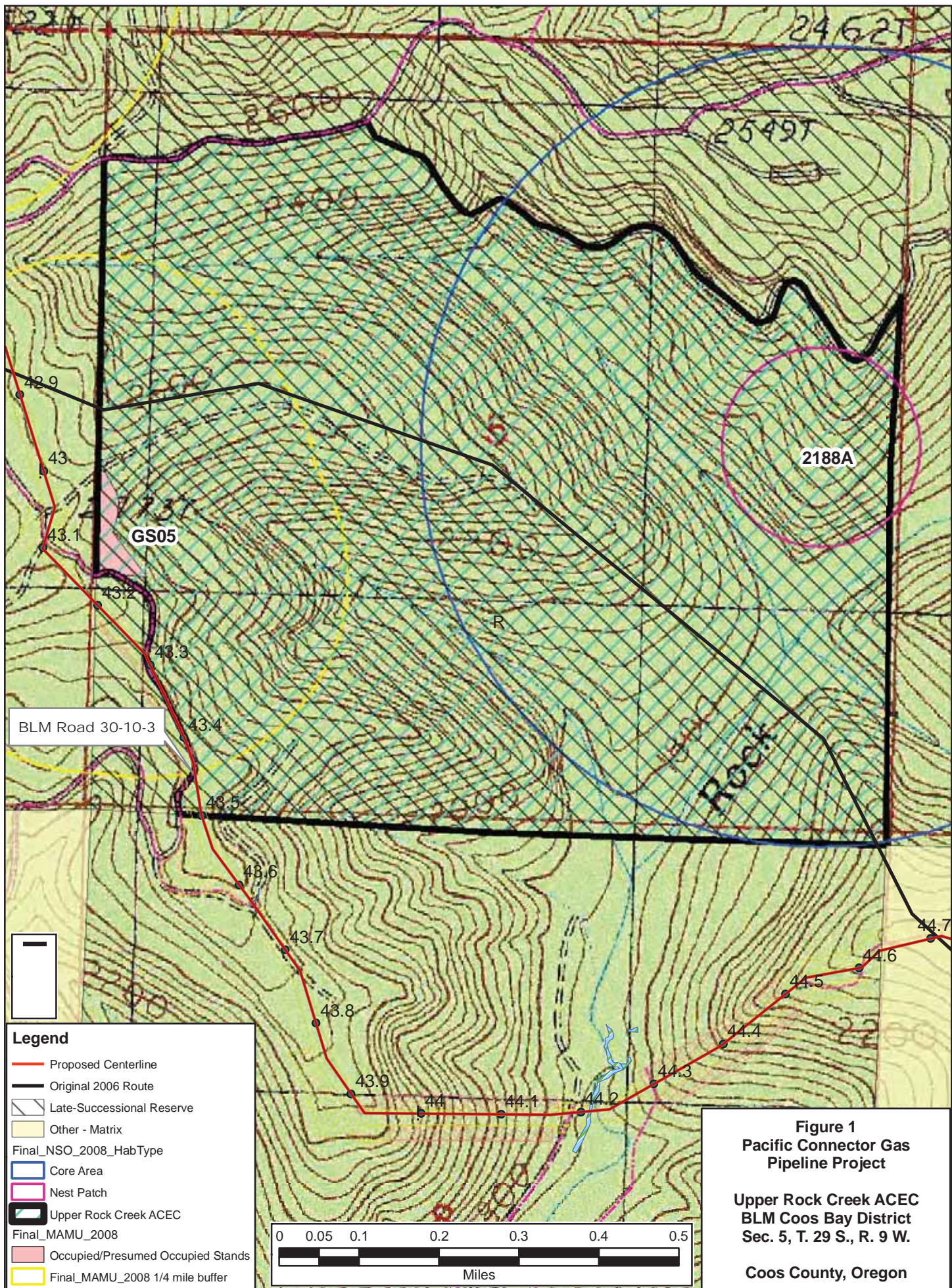
I concur with Pacific Connector's assessment that the PCGP, if constructed, would not affect the Relevant and Important values for which the Rock Creek ACEC was established.

Patricia M. Burke  
Coos Bay District Manager

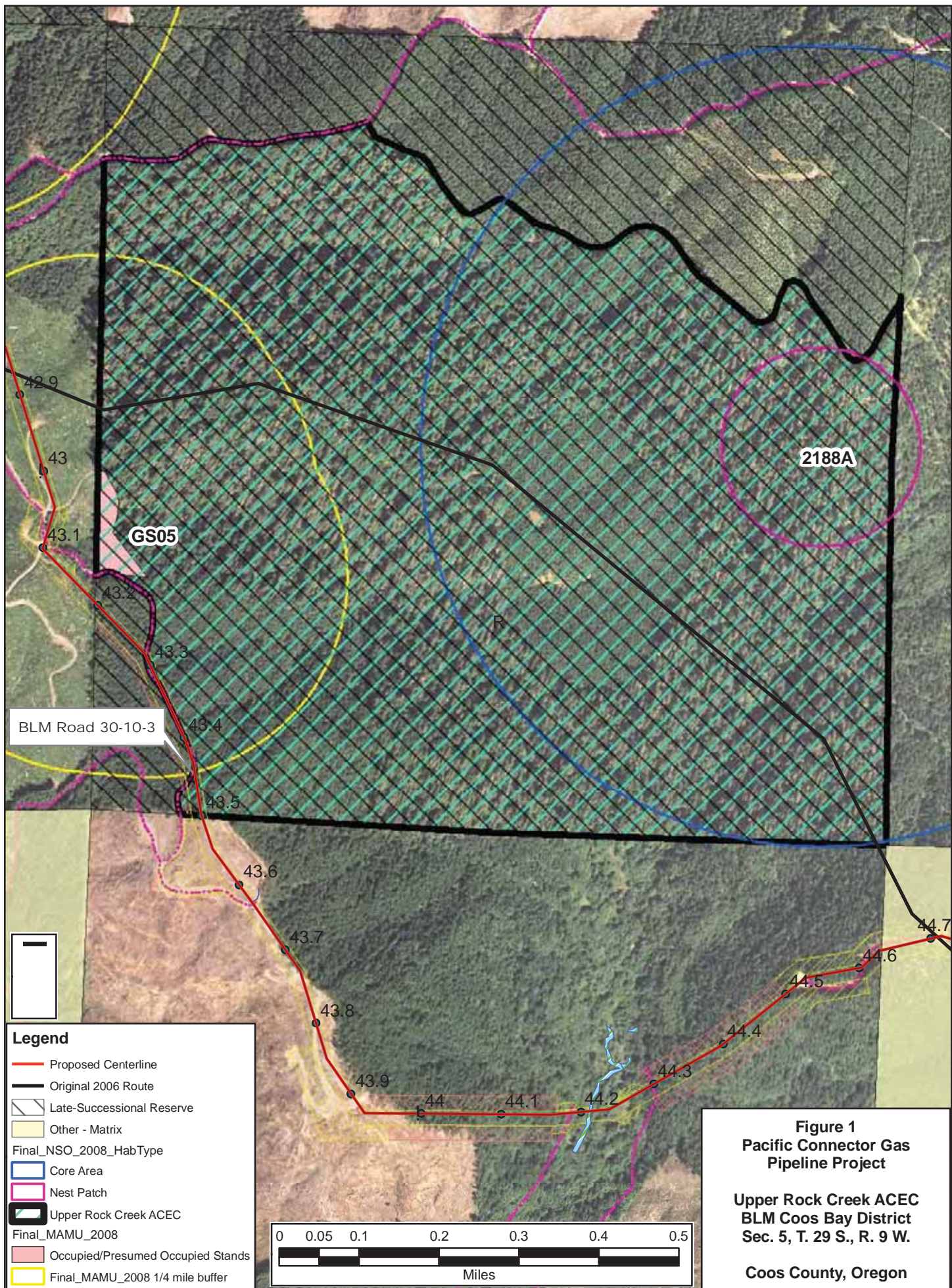
8-19-14

Date











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## **Appendix R-7**

**Compliance with the Requirements of the Final Supplemental  
Environmental Impact Statement for Management of Port-Orford  
Cedar in Southwest Oregon, Coos Bay, Roseburg and Medford  
Districts and Klamath Falls Resource Area of the Lakeview District,  
Bureau of Land Management**

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Jordan Cove Natural Gas Liquefaction and  
Pacific Connector Gas Pipeline Project  
Final EIS

**Appendix R-7**

**Compliance with the Requirements of the Final Supplemental  
Environmental Impact Statement for  
Management of Port-Orford Cedar in Southwest Oregon**

**Pacific Connector Gas Pipeline  
Coos Bay, Roseburg and Medford Districts BLM**

Prepared for:

**USDI Bureau of Land Management**

Prepared by:

**North State Resources  
Draft Working Paper**

## POC Punch List

Add disease resistant Port-Orford Cedar to ECRP Table 10.12.1

Develop direction for transition to non-affected areas for inclusion in the ECRP, TMP and alignment sheets.

**ECRP Section 12.4 NFS and BLM Lands.** Because of the contiguous pattern of NFS Lands crossed by the PCGP Project, equipment will be inspected and cleaned at cleaning stations located at the borders of each National Forest prior to clearing and grading activities in addition to being cleaned at cleaning locations adjacent to mapped noxious weed infestation areas that were identified during preconstruction surveys on federal lands and where a treatment plan has been developed in consultation with the authorized agency representative. The cleaning station(s) will be located and approved by the EIs and the authorized agency representative on federal lands. The cleaning station location(s) will also be mapped for future monitoring efforts to determine if potential infestations

Add a provision in the TMP for road use in infested areas, and transition to non-infested areas.

Add a wet weather cessation provision for PL to ECRP.

Add helicopter or cable yarding wherever preconstruction surveys show presence of PL within the corridor and uninfested stands nearby. None are known at present.

Get updated GIS from BLM of known PL infestation.



Land Management Plans of the Coos Bay, Roseburg and Medford Districts of the BLM and Siskiyou National Forest were amended in January 2004 by the Record of Decision for the Final Supplemental Environmental Impact Statement for Management of Port-Orford Cedar in SW Oregon (POC ROD). The full text of text of that amendment is provided as Attachment A of this consistency evaluation. Project-specific Standards and Guidelines (also called Management Direction) are provided in Part C of Attachment A.

Port-Orford-Cedar stands on or adjacent to the PCGP corridor known to be infested with *Phytophthora lateralis* are shown in Table 1. Application of the Risk Key from the 2004 POC ROD is documented in Table 2. Table 3 documents standards and guidelines (management direction in BLM LMPs) from the LMP amendments that is applicable to the Coos Bay, Roseburg and Medford BLM Districts. Table 3 also documents project compliance with applicable Standards and Guidelines. There is no part of the Siskiyou National Forest affected by the PCGP project.

<b>Table 1</b> <b>Port Orford Cedar Infested With <i>Phytophthora lateralis</i> on or adjacent to the PCGP Corridor.</b>				
<b>Milepost (if crossed by PCGP)</b>	<b>Location Within Vicinity of PCGP</b>	<b>Number of trees, if known</b>	<b>Year</b>	<b>Land Owner</b>
	0.1 to 0.5 mile from Georgia Pacific – Coos Bay Pipeyard (Isthmus Slough between trees and yard); 1.2 to 1.6 miles SW of MP 7.71	43	2007 - 2010	PV
	0.4mi SE of MP 10.46;0.1 mi NW of MP 10.58	3	2006, 2011	PV
	0.4 mi W/NW of MP12.49; 0.1, 0.2, and0.3mi W/SW of MP 12.81	11	2005, 2010	PV
	0.3mi SE of MP 23.53	3	2006	PV
MP 30.44 - MP 30.50	Construction ROW	11	2004, 2011	PV
MP 30.84 – MP 30.89; TEWA 30.86	Construction ROW	1	2011	PV
	0.07mi S of MP 37.42	1	2011	BLM
Source: Table 3C-3, RR # 3				

**Table 2**

**Port-Orford-Cedar Risk Key: Site-specific analysis to help determine where risk reduction management practices would be applied.**

Risk Factor	Assessment	Action Required
1a. Are there uninfected POC within, near, or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting resource management plan objectives?	No uninfested POC stands are known to exist on the Coos Bay or Roseburg BLM Districts.	Identify uninfested stands during preconstruction cruise. Action items for uninfested areas are identified in Table 3.
1b. Are there uninfected POC within, near, or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurably contributes to meeting resource management plan objectives?	No uninfested POC stands are known to exist on the Coos Bay or Roseburg BLM Districts.	Identify uninfested stands during preconstruction cruise. Action items for uninfested areas are identified in Table 3.
1c. Is the activity area within an uninfested 7th field watershed as defined in Attachment 1?	No. There are no uninfested subwatersheds on the Coos Bay or Roseburg District. Any subwatershed crossed is presumed to be infested on these units. On the Medford District, none of uninfested watersheds are crossed by the project.	If no, then risk is low and no POC management practices are required in the uninfested watersheds.
<p>1 In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.</p> <p>2 Uninfested 7th field watersheds are defined and listed in Attachment 1, and are those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.</p> <p>3 <i>Appreciable additional risk</i> does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion).</p>		

If yes, apply management practices from the list below to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfested POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.

Table3		
Compliance with Management Direction		
Management Direction	Project Level Compliance	Documentation
1) Project Scheduling: Schedule projects during the dry season or incorporate unit scheduling (Management Practice 3) and vehicle and equipment washing (Management Practice 11) as part of project design.	Applicable: Project is planned to operate during the dry season. Wet weather operations provisions are in the ECRP.	POD Section 1.2, Integrated Pest Management POD Section 5.0. Amend ECRP for wet weather direction specific POC.
2) Utilize Uninfested Water: Use uninfested water sources for planned activities such as equipment washing, road watering, and other water-distribution needs, or treat water with Clorox bleach to prevent/reduce the spread of PL (see Reference 3 for Clorox bleach label and instructions for use). To reduce the likelihood of getting Clorox in streams, add Clorox to fire trucks and road watering equipment only after they have left the stream area where they were just filled.	Applicable: Uninfested water from municipal sources would be the source of water in areas where POC disease is known to occur. Other water sources would be treated with Clorox.	ECRP Section 7.2.3 and 7.2.4. See also Hydrostatic Test POD Section 7.2.3
3) Unit Scheduling: Conduct work in all timber sale and other activity units or areas where PL is not present before working in units or areas infested with PL.	Applicable: Objective is met by requiring vehicle washing and separating project by construction spreads. Operations in Spread 1 and Spread 2 will likely be concurrent at times. POC infested areas are all contained in Spread One. Vehicles or equipment leaving Spread One would need to be washed before entering Spread 2.	POD Section 1.2, ECRP Section 12.4. IPM Section 5.0
4) Access: Designate access and egress routes to minimize exposure to PL.	Applicable:	ECRP Section 12.4 TMP: Add vehicle cleaning requirement to TMP where designated by agency reps on roads that transition from infested to non-infested.
5) Public Information: Increase public awareness of the root disease and the need to control it by using informational signs on or at trailheads, gates, and other closures, and holding coordination meetings with adjacent industrial and small woodland landowners.	Not required. This is a Plan-level responsibility of the BLM and Forest Service	
6) Fuels Management: Clean boots, vehicles, and incorporate other management practices to avoid moving infested soil out of treatment areas. Incorporate unit scheduling and vehicle and equipment washing as described in Management Practice 1 as part of project design. Select water sources as described in Management Practice 2. Specify travel routes as shown in Management Practice 4.	Applicable:	ECRP Section 12.4. Add an addendum to the slash disposal specs for cleaning in areas designated by agency reps during slash disposal

Table3

Compliance with Management Direction		
Management Direction	Project Level Compliance	Documentation
		operations..
7) Incorporate POC Objectives into Prescribed Fire Plans: Incorporate POC objectives (such as sanitation) into prescribed fire treatment plans. These include using uninfested or treated water sources and, potentially, aiding with eradication treatments.	Not Required. There is no prescribed burning outside of burn piles on the Right of Way.	
8) Routing Recreation Use: Route new trails (off-highway vehicle, motorcycle, mountain bike, horse, and foot) away from areas with POC or PL, or provide other mitigation such as seasonal closures. Trailheads will be relocated and/or established trails will be rerouted in the same manner where trails present significant risk to POC, or provide other mitigation such as site hardening.	Not required. This is a Plan level requirement for the BLM.	
9) Road Management Measures: Implement proactive disease-prevention measures including not building roads, not using existing roads, seasonal or permanent road closures, road maintenance, and/or sanitation removal of roadside POC to help reduce the likelihood of spreading the disease—especially to high-risk areas and/or identify prevention measures at a site-specific or drainage-specific level. Road design features include pavement over other surfacing, surfacing over no surfacing, removal of low water crossings, drain- age structures to divert water to areas unfavorable to the pathogen, and waste disposal.	Applicable: No new roads are constructed on the project. Road use must consider POC transmission.	POD Section 1.2, ECRP Section 12.4. An Addendum for POC operations may need to be added to the TMP.
10) Resistant POC Planting: Plant resistant POC 25 feet apart or in approximately 10 tree clusters at 100 to 150-foot spacing to lessen the potential for root grafting (a source of PL spread). Silvicultural prescriptions for sites having potential for growing POC will provide for the establishment of the species through natural or artificial regeneration and maintenance as a viable stand component through the current and future rotations. Highest priority for reforestation is replacing POC where its ecological function is most critical, such as along streams on ultramafic soils and replacing stands lost to wildfire.	Applicable: Disease resistant POC would be planted in suitable areas where POC is currently found on or adjacent to the corridor	ECRP Table 10.12.1 (table needs to be modified to add POC)
11) Washing Project Equipment: Wash project equipment prior to beginning work in uninfested project areas, when leaving infested areas to work in uninfested areas, and when leaving the project area to minimize the transportation of infested soil to uninfested areas. Equipment includes maintenance and harvest equipment coming in contact with soils, and project vehicles, including trucks and crew vehicles, leaving surfaced roads or traveling on other roads deemed at risk for spreading disease (generally project area secondary roads around diseased POC). Project areas should be compartmentalized by road system in areas with mixed ownership (Federal and private). A road system with infested areas and noninfested areas will be considered infested. Washing areas should be placed at optimum locations for minimizing spread, such as at entry/exit points of the road system with Federal control. Washing should take place as close as possible to infested sites. Wash water will be from uninfested water sources or treated with Clorox bleach. Wash water should not drain into watercourses or into areas with uninfested POC. Ideally, equipment should not travel for any substantial distance prior to being washed unless being transported on surfaced roads. Equipment moving into uninfested areas may be washed miles away as long as they do not travel through infested areas to reach their destination. Effectiveness testing indicates large reductions in inoculum by washing. Additional information about washing, and suggested parameters for field washing stations from the BLM "Port-Orford-Cedar Management Guidelines," but with an updated equipment cleaning checklist, is in Attachment 2. A Clorox bleach label and updated mixing instructions are in Reference 3.	Applicable: Cleaning sites will be incorporated into the ECRP based on pre-project surveys.	ECRP Section 12.4. Add a POC addendum to the TMP to address POC.
12) Logging Systems: Use non-ground-based logging systems (cable or helicopter).	Applicable: Helicopter and cable systems will be used on	ECRP Section 12.4. Require helicopter

Table3		
Compliance with Management Direction		
Management Direction	Project Level Compliance	Documentation
	steeper ground. Objective is met because PCGP activities will be confined to the project corridor and equipment washing is required as directed by BLM.	or cable logging if preconstruction surveys show POC within corridor and uninfested stands nearby where aerial removal would provide protection.
13) Spacing Objectives for POC Thinning: POC spacing objectives during thinning projects (commercial or precommercial) should be to create discontinuous POC populations across the management unit.	Not Applicable: PCGP is not a thinning project. This is a responsibility of the BLM.	
14) Non-POC Special Forest Products: No special forest products permits, including firewood permits, will be issued in the wet season where POC is present, unless administration previously mentioned for Bough Cutting under General Direction can be implemented. Educate the public on the risks associated with collecting in areas with POC.	Not Applicable: The PCGP does not issue permits. This is a requirement of the BLM.	
15) Summer Rain Events: Apply permit or contract clause or otherwise require cessation of operations when indicators such as puddles in the roadway, water running in roadside ditches, or increases in soil moisture (as measured by moisture meter or equivalent) indicate an unacceptable increase in the likelihood of spreading PL.	Applicable	ECRP Wet weather operations. (modify ECRP to include language specific to POC areas)
16) Roadside Sanitation: Remove or kill POC along both sides of the road. Recommended minimum width is 25 feet above the road or to the top of the cutbank, and 25 to 50 feet below the road. Roads that are open year-round generally pose the highest risk and will benefit most from sanitation treatment. Maintenance will be essential to retain benefits. POC should be re-treated as soon as possible after they reach a height of 6 inches above ground level. Sanitation treatments could be incorporated as part of routine road maintenance.	Applicable	TMP (Verify this requirement. May require modification of the TMP.
17) Site-Specific POC Management: Where possible, emphasize management of POC on sites where conditions make it likely that they will escape infection by PL, even if the pathogen has already been established nearby or may be introduced in the future. POC above roads, uphill from creeks, on ridgetops, and on well-drained sites are less likely to become infected. Emphasis may include priority retention during thinning or other silvicultural treatments, and planting to increase the presence of POC in areas unfavorable to the pathogen.	Applicable	During pre-construction surveys BLM would determine any areas where this would apply and add to Environmental Alignment Sheets.



# Attachment A

## Resource Management Plan Amendment

### Existing Standards and Guidelines are Replaced

The Standard and Guidelines (management direction) relating to Port-Orford-cedar (POC) root disease control in the existing Resource Management Plans for the Coos Bay, Medford, and Roseburg Districts, and the “Port-Orford-cedar Management Guidelines” they reference, are removed and replaced entirely with the Standards and Guidelines below. The Standards and Guidelines replaced are described as Alternative 1, the No Action Alternative, in the January 2004 “Final Supplemental Environmental Impact Statement (FSEIS) for Management of Port-Orford-Cedar in Southwest Oregon” (USDA-FS and USDI-BLM 2004 [hereafter referred to as FSEIS], pp. 2-11–2-13).

### A. Introduction

These Standards and Guidelines build upon previous research, monitoring, education, cooperation, resistance breeding, and experience with disease-controlling management practices used to reduce the spread of *Phytophthora lateralis* (PL) and maintain POC. They describe all currently known disease-control practices, dividing them between those that would be applied generally (such as community outreach and restoration) and those that may, depending upon site conditions, be applied to specific management activities (such as fuel management projects, special use permits, road maintenance, mining plans of operations, and timber sales). For the latter group, a risk key is included to clarify the environmental conditions that require implementation of one or more of the listed disease-controlling management practices. The risk key also highlights 162 currently uninfested 7th field watersheds (described and listed in Attachment 1), requiring management practices to reduce appreciable additional risk posed by proposed activities.

The objectives of these Standards and Guidelines are to:

- ⟨ Maintain POC on sites where the risk for infection is low;
- ⟨ reduce the spread and severity of root disease in high-risk areas to retain its ecological function to the extent practicable;
- ⟨ reestablish POC in plant communities where its numbers or ecosystem function have been significantly reduced; and
- ⟨ reduce the likelihood of root disease becoming established in disease-free 7th field watersheds.

## B. General Direction

**Integrated Management Approach.** An integrated approach will be implemented to deal with PL which includes prevention, restoration, detection, evaluation, suppression, and monitoring. Management goals are directed toward maintaining POC and reducing root disease losses. Elements of the management strategy include management of POC bough cutting, community outreach, genetics, interagency coordination, planning, wildland fire operations, snag retention, project-specific direction, risk key, management practices, and monitoring.

In portions of the natural range, POC is widespread across the landscape. In these areas, POC conservation will emphasize management on sites naturally at low risk for infection. In many forest types, management of POC can focus on sites where conditions make it likely to escape infection by PL, even if the pathogen has already been established nearby. POC on such sites often has escaped infection because the sites have characteristics that are unfavorable for the spread of the pathogen. These sites are above and away from roads, uphill from creeks, on ridgetops, and on well-drained soils.

In the majority of the natural range, POC is localized on moist microsites (such as along streams) or sites favorable for establishment of the species. In these areas, opportunities for managing for POC on sites unfavorable to the pathogen are more limited. Treatments to prevent new infestations will be emphasized in this portion of the range, and there is a potential for eradication treatments in certain circumstances.

**Restoration of Port-Orford-Cedar.** Restore POC to sites within its natural range where the species measurably contributes to meeting Resource Management Plan objectives for both aquatic and terrestrial ecosystems, Tribal, or product uses or function. This will be accomplished using resistant and nonresistant (generally on low-risk sites or away from potential infection sources) stock for reforestation and other elements of the integrated management approach.

**Adaptive Management.** Adaptive management is a continuing process of action-based planning, monitoring, researching, evaluating, and adjusting with the objectives of improving the implementation and achieving the goals of the selected alternative. Under the concept of adaptive management, new information will be evaluated and a decision made whether to make adjustments. The Agency will continue to develop and evaluate techniques to protect POC, and prevent disease intensification and spread within and around areas where PL infestations already occur.

**Bough Cutting.** To reduce or eliminate the spread of PL by POC bough cutters, limit POC bough cutting to roadside sanitation, commercial thinning, and precommercial thinning units (or stewardship contracts with specific provisions to protect and enhance POC).

POC bough collection will be by permit only, and require:

- < Dry season operations;
- < designation of access and egress routes;
- < designation of parking areas;
- < unit scheduling (collect all uninfested areas prior to infested areas);
- < washing of boots and equipment;

- < daily inspections;
- < stopping operations during and after rains; and
- < easily identifiable areas where boughs are to be collected.

Community Outreach. Continue to improve public awareness of the root disease and the need to control it by using methods such as periodic press releases; distributing posters and pamphlets; coordinating with Tribal groups; creating and maintaining POC websites; conducting public symposiums; preparing and installing informational signs on or at trailheads, gates, and other closures; and/or other measures. Consider focusing these efforts on user groups most likely to engage in activities at more risk for spreading PL. Coordinate with state, local, industrial, and small woodland owners to help meet overall POC management objectives.

Eradication. In watersheds or other geographic areas where PL infestations are localized or infrequent in comparison to the amount of POC, POC eradication may be tried as a management technique to prevent/reduce spread of the disease and reduce the need for other management practices in the long term. If experience demonstrates techniques and conditions where this treatment can be effective, its use can be increased. Additional tools for eradicating PL in the soil will be sought, developed, and implemented as evidence warrants.

Genetics. Develop resistant stock and make it available for all POC reforestation and restoration projects.

The existing interagency resistance breeding program will be continued as needed, contingent on available funding. The objectives are to (1) select and evaluate families for resistance and develop durable resistance to PL while maintaining broad genetic diversity within the species, and (2) produce seed genetically resistant to PL for deployment throughout the range of where PL is present. The POC resistance breeding program will continue as follows:

- < Develop operational resistant seed for breeding zones (breeding blocks plus elevation zones) based upon management needs within the range of POC;
- < continue efforts to inform the public about the availability and use of resistant seed;
- < find ways to provide resistant seed to non-Federal landowners; and
- < monitor the operational performance of resistant plantings.

In addition, collect and maintain about 0.5 pound of resistant seeds for each POC breeding zone in organized conservation seedbanks. This seed will be reserved exclusively for reforesting areas after the occurrence of stand-replacement events such as large-scale wildfires. Where possible, resistant POC seedlings will be planted in such locales, with the goal to reintroduce POC to all pre-event locations.

Finally, as described in the Record of Decision, the Agency will prepare a benefit analysis by seed zone and elevation of an accelerated resistance breeding program, and then, if still warranted by a substantial long-term cost savings and environmental benefits, to pursue potential sources for the necessary increased funding.

**Interagency Coordination.** The agencies will continue to coordinate management practices including research, genetic resistance breeding, and public education.

**Planning.** Consideration of how to achieve the POC management objectives will be addressed, as applicable, in new NEPA documents, watershed analyses, Late-Successional Reserve assessments, wild and scenic river management plans, transportation planning (roads analysis process or transportation management objectives), fire management plans, recreation planning, and other activities or strategies in all watersheds with POC.

**Wildland Fire Operations.** Management strategies to prevent/reduce spread of PL will be a part of wildland fire preparedness planning. When practicable, these measures will be incorporated into firefighting activities. Such practices may include treating firefighting water with Clorox bleach or other registered material to kill waterborne PL spores, washing vehicles, and washing tools and clothing. However, POC issues may become a secondary priority during wildland fire operations. While management objectives for POC are a concern, safety of firefighters and the public, and protection of property is always a higher priority. Existing or “in-place” disease-controlling management practices such as road closures may be compromised.

Road closures and other compromised POC disease-controlling measures will be reinstalled following suppression and emergency rehabilitation unless changed circumstances indicate otherwise. Fire rehabilitation efforts would include POC and PL considerations.

**Snag Retention.** Emphasize the retention of POC snags in Riparian Reserves because they are resistant to decay and the resultant down logs can provide durable structural components for both aquatic and terrestrial ecosystems. Retention numbers should consider that few additional large POC snags are likely to become available in the near future in infested areas because of the current mortality and presence of PL. This direction is particularly applicable to plant associations on ultramafic soils and other locations where POC can be some of the largest and most abundant trees.

**Disease Export.** Where the agencies have reason to believe heavy equipment working in infested stands will next travel through or to substantially uninfested private or public POC areas, such as in uninfested watersheds or different administrative units, heavy equipment, including road maintenance equipment that has left surfaced (rocked or paved) roads in infested POC areas, will be washed upon leaving infested project areas to minimize transport of infested soil to uninfested areas. Washing areas will be located as described under Management Practice 11 (Washing Project Equipment) in the following Management Practices section.

## C. Project-Specific Direction and Port-Orford-Cedar Risk Key

One or more of the management practices listed under the following Management Practices subheading will be applied to site-specific management activities when a need is indicated by the POC Risk Key. This approach precludes the need for additional project-specific analysis of mid- and large-geographic and temporal-scale effects because the risk key describes conditions where risk reduction management practices are assumed (expected) to be applied.

When a project-specific application of the risk key shows the risk is low, no additional management practices are needed. Project-specific NEPA analysis will appropriately document the application of the risk key and the consideration of the available management practices. Application of the risk key and application of resultant management practices (if any) will make the project consistent with the mid- and large-geographic and temporal-scale effects described by the SEIS analysis, and will permit the project analysis to tier to the discussion of those effects.

For the application of this risk key, the definition of project would not be limited to any one type of management activity. For example, projects such as road maintenance projects, livestock grazing permits, recreation management projects and permits, fuel wood permits, non- POC special forest products permits, and other uses subject to permitting or other specific Agency authorization action, likely to introduce significant risk to essential POC require implementation of applicable management practices at the time of planning or reissuance of permits when indicated by application of the key.

**Port-Orford-Cedar Risk Key: Site-specific analysis to help determine where risk reduction management practices would be applied**

1a. Are there uninfected POC within, near<sup>1</sup>, or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting resource management plan objectives?

1b. Are there uninfected POC within, near<sup>1</sup>, or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurably contributes to meeting resource management plan objectives?

1c. Is the activity area within an uninfested 7th field watershed as defined in Attachment 1?

If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices are required.

If the answer to any of the three questions is yes, continue.

2. Will the proposed project introduce appreciable additional risk<sup>3</sup> of infection to these uninfected POC?

If no, then risk is low and no POC Management practices are required.

If yes, apply management practices from the list below to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.

<sup>1</sup> In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

<sup>2</sup> Uninfested 7th field watersheds are defined and listed in Attachment 1, and are those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

<sup>3</sup> Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion).

The objective of the risk key is to identify project areas/situations where new infections should be avoided, and guide the application of one or more of the management practices until the

risk is acceptably mitigated. The risk key describes circumstances under which the various risk reducing management practices will be applied where needed.

## Port-Orford-Cedar Risk Key Definitions and Examples

**Additional risk** ~ The intent is to mitigate or avoid the potential risk for infection that is appreciably above background or existing risk levels, commensurate with the value of the potentially affected resource and the cost of the mitigation or avoidance. Where background or existing potential risk of infection levels are low, an apparently minor activity such as a permitted one-time event or trail maintenance, might create appreciable additional risk. In checkerboard ownerships near private timberlands, near roads that have reciprocal rights-of-way agreements not addressing POC, or near major public use areas, such activities would likely not create appreciable “additional” risk since the risk already exists. In other words, mitigation (application of management practices or other options identified in the risk key) is only required by the key when, in the context of the risk coming from already existing activities essentially beyond the practical control of the Agencies, it can make a cost-effective and important difference.

**Measurably contributes to meeting resource management plan objectives** ~ The uninfected POC in question is so located, or covers such a geographic area such, that it measurably contributes to meeting Resource Management Plan objectives and/or all applicable laws and regulations. The effects discussions in the FSEIS provide much of the basis for this determination; if no adverse effect is identified for POC mortality, then the likelihood of various mortality having an adverse effect on Resource Management Plan objectives is low.

**Resource Management Plan objectives** ~ Includes, but is not limited to, maintaining forested landscapes, species diversity, soil stability, stream temperatures (including State 303(d) requirements), buffering seasonal stream flow fluctuations, supplying large wood from streams and wildlife, visual quality, habitat for rare or unique plants, habitat for threatened, endangered, sensitive/special status, or other Agency-emphasis species, product collection and harvest, designated wilderness values, research opportunities, and genetic diversity.

**Measurably contributes to** ~ Means the POC at risk from the proposed activity makes a meaningful and unique contribution to the plan objective in question. Where POC is a small percentage of the stand or does not provide unique stand attributes (not providing the largest trees in the stand, for instance), its loss is probably not meaningful when measured against management objectives. Similarly, where stream shading, bank stability, and other riparian functions are readily performed by other species onsite, POC mortality is probably not meaningful. Where POC mortality could affect rare or unique plants, but mortality has been demonstrated to benefit such plants, POC mortality is probably not meaningful.

On the other hand, where POC is a significant portion of the riparian vegetation and its loss would likely lead to creating or exacerbating stream temperature, bank stability, turbidity, or other problems, POC is making a meaningful contribution to Resource Management Plan objectives. Significant geographic areas in designated wilderness are making a meaningful contribution. POC as a large percentage of the stand in recreation or visually sensitive areas are probably making a meaningful contribution. Where POC is part of the reason for the designation of a research natural area or area of critical environmental concern, it is making a meaningful contribution. POC protecting rare plants, or serving as nest structures for listed species, are probably making a meaningful contribution if substitutes are not readily available.



It is more likely that POC is making a meaningful contribution to Resource Management Plan objectives if the site is within the 90,900 acres in Oregon where POC is prominent in the overstory (see Reference 1).

## Management Practices

Management practices are designed to:

- ( Prevent/reduce the import of disease into uninfested areas (offsite spores picked-up and carried into an uninfested project area);
- ( prevent/reduce the export of disease to uninfested areas (onsite spores moved to offsite, uninfested area); and
- ( minimize increases in the level of inoculum or minimize the rate of spread in areas where the disease is localized or infection is intermittent.

One or more of the management practices from the list below will be selected and implemented when there is a management need indicated by the POC Risk Key. No priority is assumed by the order listed below; the one or combination of specific practices best fitting the nature of the risk and the site-specific conditions will be applied when indicated by the risk key. Practices can be modified or partially implemented if such changes still meet risk reduction objectives and/or better fit site conditions. As noted in the Pathology section of the FSEIS (see Reference 2), combinations of practices can be more effective than single practices, depending on site-specific circumstances.

- 1) Project Scheduling: Schedule projects during the dry season or incorporate unit scheduling (Management Practice 3) and vehicle and equipment washing (Management Practice 11) as part of project design.
- 2) Utilize Uninfested Water: Use uninfested water sources for planned activities such as equipment washing, road watering, and other water-distribution needs, or treat water with Clorox bleach to prevent/reduce the spread of PL (see Reference 3 for Clorox bleach label and instructions for use). To reduce the likelihood of getting Clorox in streams, add Clorox to fire trucks and road watering equipment only after they have left the stream area where they were just filled.
- 3) Unit Scheduling: Conduct work in all timber sale and other activity units or areas where PL is not present before working in units or areas infested with PL.
- 4) Access: Designate access and egress routes to minimize exposure to PL.
- 5) Public Information: Increase public awareness of the root disease and the need to control it by using informational signs on or at trailheads, gates, and other closures, and holding coordination meetings with adjacent industrial and small woodland landowners.

6) **Fuels Management:** Clean boots, vehicles, and incorporate other management practices to avoid moving infested soil out of treatment areas. Incorporate unit scheduling and vehicle and equipment washing as described in Management Practice 1 as part of project design. Select water sources as described in Management Practice 2. Specify travel routes as shown in Management Practice 4.

7) **Incorporate POC Objectives into Prescribed Fire Plans:** Incorporate POC objectives (such as sanitation) into prescribed fire treatment plans. These include using uninfested or treated water sources and, potentially, aiding with eradication treatments.

8) **Routing Recreation Use:** Route new trails (off-highway vehicle, motorcycle, mountain bike, horse, and foot) away from areas with POC or PL, or provide other mitigation such as seasonal closures. Trailheads will be relocated and/or established trails will be rerouted in the same manner where trails present significant risk to POC, or provide other mitigation such as site hardening.

9) **Road Management Measures:** Implement proactive disease-prevention measures including not building roads, not using existing roads, seasonal or permanent road closures, road maintenance, and/or sanitation removal of roadside POC to help reduce the likelihood of spreading the disease—especially to high-risk areas and/or identify prevention measures at a site-specific or drainage-specific level. Road design features include pavement over other surfacing, surfacing over no surfacing, removal of low water crossings, drain- age structures to divert water to areas unfavorable to the pathogen, and waste disposal.

10) **Resistant POC Planting:** Plant resistant POC 25 feet apart or in approximately 10 tree clusters at 100 to 150-foot spacing to lessen the potential for root grafting (a source of PL spread). Silvicultural prescriptions for sites having potential for growing POC will provide for the establishment of the species through natural or artificial regeneration and maintenance as a viable stand component through the current and future rotations. Highest priority for reforestation is replacing POC where its ecological function is most critical, such as along streams on ultramafic soils and replacing stands lost to wildfire.

11) **Washing Project Equipment:** Wash project equipment prior to beginning work in uninfested project areas, when leaving infested areas to work in uninfested areas, and when leaving the project area to minimize the transportation of infested soil to uninfested areas. Equipment includes maintenance and harvest equipment coming in contact with soils, and project vehicles, including trucks and crew vehicles, leaving surfaced roads or traveling on other roads deemed at risk for spreading disease (generally project area secondary roads around diseased POC). Project areas should be compartmentalized by road system in areas with mixed ownership (Federal and private). A road system with infested areas and noninfested areas will be considered infested. Washing areas should be placed at optimum locations for minimizing spread, such as at entry/exit points of the road system with Federal control. Washing should take place as close as possible to infested sites. Wash water will be from uninfested water sources or treated with Clorox bleach. Wash water should not drain into watercourses or into areas with uninfected POC. Ideally, equipment should not travel for any substantial distance prior to being washed unless being transported on surfaced roads. Equipment moving into uninfested areas may be washed miles away as long as they do not travel through infested areas to reach their destination. Effectiveness testing indicates large reductions in inoculum by



washing. Additional information about washing, and suggested parameters for field washing stations from the BLM “Port-Orford-Cedar Management Guidelines,” but with an updated equipment cleaning checklist, is in Attachment 2. A Clorox bleach label and updated mixing instructions are in Reference 3.

12) Logging Systems: Use non-ground-based logging systems (cable or helicopter).

13) Spacing Objectives for POC Thinning: POC spacing objectives during thinning projects (commercial or precommercial) should be to create discontinuous POC populations across the management unit.

14) Non-POC Special Forest Products: No special forest products permits, including firewood permits, will be issued in the wet season where POC is present, unless administration previously mentioned for Bough Cutting under General Direction can be implemented. Educate the public on the risks associated with collecting in areas with POC.

15) Summer Rain Events: Apply permit or contract clause or otherwise require cessation of operations when indicators such as puddles in the roadway, water running in roadside ditches, or increases in soil moisture (as measured by moisture meter or equivalent) indicate an unacceptable increase in the likelihood of spreading PL.

16) Roadside Sanitation: Remove or kill POC along both sides of the road. Recommended minimum width is 25 feet above the road or to the top of the cutbank, and 25 to 50 feet below the road. Roads that are open year-round generally pose the highest risk and will benefit most from sanitation treatment. Maintenance will be essential to retain benefits. POC should be re-treated as soon as possible after they reach a height of 6 inches above ground level. Sanitation treatments could be incorporated as part of routine road maintenance.

17) Site-Specific POC Management: Where possible, emphasize management of POC on sites where conditions make it likely that they will escape infection by PL, even if the pathogen has already been established nearby or may be introduced in the future. POC above roads, uphill from creeks, on ridgetops, and on well-drained sites are less likely to become infected. Emphasis may include priority retention during thinning or other silvicultural treatments, and planting to increase the presence of POC in areas unfavorable to the pathogen.

## D. Monitoring

### Introduction

To maintain POC as an ecologically and economically significant species on BLM-administered lands, management strategies (both actions and inactions) will be evaluated.

## Implementation Monitoring

### Questions

- 1) Have resistance breeding and genetic conservation requirements been met?
- 2) Are General Direction requirements for maintaining and reducing the risk of PL infections being implemented?
- 3) Are project-specific management actions applied as required?

### Requirements

- 1) The Agency will address current accomplishments including levels of established conservation seedbanks in annual updates for the resistance breeding program.
- 2) District annual program summaries will include the general activities accomplished for maintaining and reducing the risk of PL infections.
- 3) Administrative units will incorporate POC management actions into their existing project-specific implementation monitoring programs.

## Effectiveness and Validation Monitoring

### Questions

- 1) Is the genetic resistance program producing POC seedlings that survive long term under field conditions?
- 2) Are disease-controlling mitigation measures, such as road use restrictions and closures, sanitation, and washing, effective as predicted, and is the risk associated with projects such as fire suppression at presumed or predicted levels?
- 3) Has the spread or non-spread of the disease significantly departed from the predictions made in the FSEIS that were used to select this management strategy (see Reference 4)?
- 4) Is the disease being kept out of the uninfested watersheds and if not, have appropriate eradication treatments been tried and are they successful?

### Requirements

- 1) The Agencies will annually report survival results of validation studies that determine effectiveness of the genetic resistance program.
- 2) The USDA-FS Southwest Oregon Forest Insect and Disease Service Center will continue working with BLM field units to evaluate and coordinate existing management techniques to reduce the occurrence of PL and retain healthy POC. Emphasis will be directed towards ongoing projects and monitoring their results. Actual monitoring will be



split between the Service Center and the administrative units where management occurs. Additional (new) monitoring efforts will be a function of available budget and workforce. (An example is whether prescribed fire heats the soil enough to be effective as an eradication treatment.) In some cases, university research will be the appropriate vehicle to accomplish evaluations of management techniques.

3) As new inventory data (continuous vegetation survey and forest inventory and analysis) and local mapping becomes available, it will be evaluated for current levels (acres and/or number of trees) of infected and uninfected POC and corresponding trends. Inventory plots are typically reinventoried on a 3- to 10-year cycle, depending upon location.

4) Road, aerial, or photo surveys of the uninfested watersheds will be done to identify new infestations at least once every 5 years.

## Consultation-Related Monitoring

The Conservation Recommendations from NOAA-Fisheries listed below and applicable to POC eradication, sanitation, and similar PL control projects, will be met as follows: Items 1, 3, and 4 will be reported by administrative units as part of regular POC work accomplishment reporting, and compiled and reported to NOAA-Fisheries and U.S. Fish and Wildlife Service each year as it becomes available. Normal activity reporting years (fiscal) will be used.

NOAA-Fisheries Conservation Recommendations (NOAA-Fisheries 2004):

“1. The FS and BLM should monitor the implementation of future site level projects and their authorized incidental take statements to determine if modification to these Standards and Guidelines are warranted for the protection and conservation of listed species.

3. The FS and BLM should monitor the number of acres of POC eradication projects implemented each year to determine if the assumptions in the EIS and this Opinion have been exceeded. Furthermore, report the amounts annually to NOAA-Fisheries by January 31 of the following year. The report should include a description [of] the acreage occurring within one site potential tree height of a stream.

4. The FS and BLM should monitor the number of miles of POC sanitation projects implemented each year to determine if the assumptions in the EIS and this Opinion have been exceeded. Furthermore, report the amounts annually to NOAA-Fisheries by January 31 of the following year. The report should include a description [of] the miles of road side treated within one site potential tree height of a stream.”

## E. Attachments

### Attachment 1: Description of Uninfested 7th Field Watersheds, Table of Watersheds, and Map

#### Description of Uninfested 7<sup>th</sup> Field Watersheds

“Uninfested 7<sup>th</sup> field watersheds” are watersheds with greater than 50 percent Federal ownership and with greater than 100 Federal acres in stands that include POC (not including plantations where POC did not previously occur), where at least the Federal lands are uninfested or essentially uninfested (see the following table) with PL. These stands occur in Matrix as well as various Reserve land allocations. Uninfested POC stands within these watersheds (about 49,000 acres) are referred to as POC cores. POC cores are not necessarily contiguous acres. Analysis done for the FSEIS using existing GIS stand mapping indicates there are 162 currently uninfested 7<sup>th</sup> field watersheds in Oregon (BLM and FS). Actual watersheds included, and POC core boundaries, depend on the absence of PL at the time the Record of Decision is signed, and where POC occurs on the ground. Stands with any level of POC are included. Uninfested watersheds expected to have over 100 acres of POC within

10 years of this Record of Decision as a result of natural or artificial regeneration of POC stands burned in the Biscuit Fire will be considered uninfested 7<sup>th</sup> field watersheds. Watersheds no longer qualify for POC cores if 5 percent or more of the POC core area becomes infested with PL. Because these watersheds sometimes empty into a larger stream that is infested, infestations within the lowest 2 acres of the watershed (and lowest 200 feet of stream) do not count against the current uninfested status or the 5 percent.

The existing mapping protocols used for determining the 7th field watersheds shown on the Map are not necessarily consistent between administrative units or with standard 6th field mapping. If 7th field watershed maps are revised to a regional standard in the future, it does not change the designation of POC cores. POC core areas identified with the existing protocol would be considered permanent unless 5 percent or more become infested, or they are changed through a future NEPA decision.

#### Table of Uninfested 7<sup>th</sup> Field Watersheds

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The following 7th field watersheds are those that Agency GIS databases indicate meet the description of uninfested watersheds above. Text above also explains that actual field conditions are the final determinant as to whether a watershed is ultimately considered uninfested for the purpose of these Standards and Guidelines. These watersheds are referenced in question 1c in the risk key.

Summary of 7th field watershed cores and buffers <sup>1</sup>

District or Forest	Number of watersheds	Federal acres		Buffer acres	Federal and private acres in watershed	% Federal ownership
		Core Matrix/ Riparian Reserve/ Adaptive Management Area acres	Core reserve acres			
Coos Bay	0	0	0	0	0	0
Medford	18	8	7,137	22,201	33,414	88
Roseburg	0	0	0	0	0	0
Siskiyou	144	6,343	35,881	193,799	244,867	96
<b>Total</b>	<b>162</b>	<b>6,351</b>	<b>43,018</b>	<b>216,000</b>	<b>278,281</b>	<b>95</b>

<sup>1</sup> Includes watersheds with up to 2 acres PL; excludes watersheds with less than 50% Federal administration.

Subwatershed number	Port-Orford-cedar disease-free 7th field watersheds <sup>1</sup>		Core reserve acres <sup>2,3</sup>	Non-Port-Orford-cedar Federal acres	Total sub-watershed acres <sup>4</sup>	% Federal ownership
	Core Matrix/ Riparian Reserve/ Adaptive Management Area acres	Core reserve acres				

Roseburg and Coos Bay	0	0	0	0	0
Total [0 watersheds]	0	0	0	0	0

Medford

17100310010536	0	227	951	1,178	100
17100310010539	0	950	504	1,454	100
17100310010545	0	546	836	1,382	100
17100309050103	2	514	621	1,251	91
17100309050218	0	188	3,139	5,152	65
17100310010603	0	115	450	781	72
17100310040103	0	174	2,065	2,929	76
17100310040106	0	605	2,038	2,643	100
17100310040212	0	239	747	986	100
17100310040215	0	324	2,781	3,105	100
17100310040612	0	113	1,201	1,314	100
17100310040618	6	1,076	2,670	3,752	100
17100310040630	0	797	620	1,417	100
17100310040727	0	109	248	357	100
17100311050106	0	217	690	941	96
17100311050115	0	460	847	1,615	81
17100311050121	0	377	1,241	1,986	81
17100311050203	0	106	552	1,170	56
Total [18 watersheds]	8	7,137	22,201	33,414	88

<sup>1</sup> 7th field watersheds with at least 50 percent Federal ownership, at least 100 acres of POC, and either uninfested or infestation limited to the lowermost 2 acres of the watershed. Acres reflect stands assumed lost in Biscuit Fire.

<sup>2</sup> Data is approximate, based on current Agency mapping analyzed with GIS systems. Actual size of core and buffer areas may vary based on actual field conditions.

<sup>3</sup> Reserves include Late-Successional Reserves, Congressional Reserves, and Administratively Withdrawn.

<sup>4</sup> Includes private acres

## Attachment 2: General Specifications for a Washing Station and Equipment Cleaning Checklist

The following specifications are from the 1994 BLM “Port-Orford-cedar Management Guidelines,” (FSEIS, Appendix 1). The Equipment Cleaning Checklist is from the POC FSEIS (FSEIS, Appendix 13).

### General Specifications for a Field Washing Station

**Purpose:** The purpose of the washing station is to remove as much soil and organic matter from vehicles as possible to prevent/reduce the spread of PL. The intent is to reduce the spread of PL into uninfested areas. Washing can be accomplished with a mixture of chlorine bleach and water or by steam cleaning. The ration of chlorine bleach to water is 12 ounces of bleach per 1,000 gallons of wash water.

When locating and constructing a washing station to clean vehicles and equipment, we need to minimize the chance that a “clean” truck will be re-exposed to infested material near the washing site. There are two ways this can happen. One is if the truck travels through an area where “unclean” trucks are also traveling. This can be minimized by proper location of the washing station. If some common travel ways are used, efforts need to be made that will reduce the chance of picking up soil. This can be accomplished by rocking the common road surface or hardening it in some other fashion. Reducing the amount of water used for dust abatement will lessen the amount of mud which may also prove useful.

The second way a “clean” truck could become a carrier again is by traveling through wash water and mud at the washing station. Proper construction of the site will eliminate this risk. Runoff of the wash water needs to drain away from the wash site and away from the travel route to and from the site. Wash water must not be allowed to drain into stream channels. The actual washing site needs to be elevated so that the trucks are not sitting in mud and wash water. This could be accomplished by ramps or by building a sufficiently high rocked surface on which the trucks can travel. The length of the rocked surface wash area should be at least 1.5 times the length of the trucks that will be using it. This will allow the trucks to travel on a non-contaminated surface for a short distance after being washed and reduce the chances of picking up infested soil from the washing. The gravel used for rocking should be of sufficient size to allow good percolation of water and soil into the subsurface. Accumulations of water and soil on the surface should be avoided. This last point also affects the depth of the rocked road surface. The amount of washing and the number of trucks using the site will also influence the depth.

The type of equipment used for washing needs to be sufficient to remove all soil and organic matter that is clinging to the trucks. The actual water pressure required can best be determined on the site.

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## Equipment Cleaning Checklist

This checklist (for optional use) is referenced in the Washing Project Equipment management practice.

The purpose of this checklist is to provide guidance in the cleaning of equipment, as stipulated in contracts, to control or prevent the spread of noxious weeds and PL. The checklist directs attention to specific areas on equipment that are likely to accumulate soil and organic material. Questions to ask about overall equipment cleanliness are:

- 1) Does the equipment appear to have been cleaned?
- 2) Is the equipment clean of clumps of soil and organic matter?

### Rubber-Tired Vehicles

- ☐ Tires
- ☐ Wheel rims (underside and outside)
- ☐ Axles
- ☐ Fenders/wheel wells/trim
- ☐ Bumpers

### Track-Laying Vehicles

- ☐ Tracks
- ☐ Road wheels
- ☐ Drive gears
- ☐ Sprockets
- ☐ Roller frame
- ☐ Track rollers/idlers

### All Vehicles

- ☐ Frame
  - ☐ Belly pan (inside)
  - ☐ Stabilizers (jack pads)
  - ☐ Grapple and arms
  - ☐ Dozer blade or bucket and arms
  - ☐ Ripper
  - ☐ Brush rake
  - ☐ Winch
  - ☐ Shear head
  - ☐ Log loader
  - ☐ Water tenders (empty or with treated water)
  - ☐ Trailers (low-boys)
  - ☐ Radiator/grill
  - ☐ Air filter/pre-cleaner
  - ☐ Struts/springs/shocks
  - ☐ Body seams
-

## Attachment 3: Definitions

The following terms have been reproduced from the FSEIS Glossary because they are used in the Record of Decision or Plan Amendment, or are readily applicable to implementation. No departure from the FSEIS Glossary definitions is intended; they are listed here for convenience, and the FSEIS Glossary may continue to be used for any terms that were not included below.

**Activity area** ~ Used in the risk key, the portion of the project area where potentially PL-disturbing activities will take place, including related transportation routes and parking areas. Usually not synonymous with the NEPA “analysis area”, or fish consultation “action area”.

**Adaptive management** ~ A continuing process of action-based planning, monitoring, re-searching, evaluating, and adjusting with the objective of improving implementation and achieving the goals of the standards and guidelines.

**Breeding** ~ The science or art of changing the genetic constitution of a population of plants or animals.

**Breeding block** ~ A breeding block designates the geographic area which envelops a number of breeding zones.

**Breeding zone** ~ A breeding zone designates a unit of land in which an improved population of a species is being developed. Progeny testing and/or breeding activity is conducted to obtain an “improved” population (for one or more traits of interest) over time. The boundaries of a breeding zone may or may not coincide with seed zones. In many instances, a breeding zone covers multiple seed zones.

**Buffer** ~ In Alternatives 3 and 6, all lands within the currently uninfested 6th or 7th field watersheds (respectively) except stands containing POC (see Chapter 2).

**Core** ~ In Alternative 3 and 6 (and 2), stands with POC within the currently uninfested 6th or 7th field watersheds (respectively) (see Chapter 2).

**Disease** ~ An abnormal, injurious physiological condition brought about by a continuous irritation. Plant disease usually involves a complex relationship between a susceptible host, a conducive environment, and a causal agent called a pathogen.

**Dry season** ~ From the Pathology section of the FSEIS, generally between June 1 and September 30, when conditions are dry and temperatures typically exceed 68 degrees F.

**Eradication** ~ Removal of live POC around a PL infestation to keep PL from spreading.

**Fire management plan** ~ A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land or resource management plan.

**Ground-based logging system** ~ Tractor or cable partial suspension (as opposed to cable full suspension or helicopter).

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Heavy equipment ~ Wheeled or tracked equipment other than highway vehicles, used for construction, road maintenance, logging, pipe-laying, and similar work; some examples are backhoes, Bobcats®, skidders, yarders, and graders.

High-risk site ~ Low-lying wet areas (infected or not) that are located downslope from already infected areas or below likely sites for future introductions, especially roads; they include streams, drainage ditches, gullies, swamps, seeps, ponds, lakes, and concave low-lying areas where water collects during rainy weather.

Infected ~ Refers to the attack of a living organism by a pathogen (the pathogen enters and establishes a pathogenic relationship with its host).

Infested ~ Refers to soil or other substratum that is occupied by a pathogen (used in the sense of “contaminated”).

Inoculum ~ (1) The substance, generally a pathogen, used for inoculating; (2) to put a micro-organism or virus, or a substance containing one of the aforementioned, into an organism or substratum. Also, pathologists use these terms to apply both to inoculations conducted by humans and to inoculations that occur in nature.

Land Use Allocations (LUAs) or Land Allocations ~ Use in this SEIS is limited to the seven designations of management emphasis identified in land and resource management plans for each administrative unit as a result of the 1994 “Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.” The seven land allocations are Congressionally Reserve, Late-Successional Reserve, Adaptive Management Area, Managed Late-Successional Areas, Administratively Withdrawn, Riparian Reserve, and Matrix.

Late-successional forests ~ Forest stands consisting of trees, structural attributes, supporting biological communities, and processes associated with old-growth and/or mature forests. Forest seral stages that include mature and old-growth age classes. Age is not necessarily a defining characteristic but has been used as a proxy or indicator in some usages. Minimum ages are typically 80 to 130 years, depending on the site quality, species, rate of stand development, and other factors.

Late-Successional Reserve ~ Land allocation under the Northwest Forest Plan with the objective to protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old-growth forest-related species, including the northern spotted owl. Limited stand management is permitted, subject to review by the Regional Ecosystem Office.

Low-risk site ~ A site with characteristics unfavorable for spread and infection by a particular pathogen.

Maintenance ~ The retention of POC.

Matrix ~ Federal lands outside of reserves, withdrawn areas, managed Late-Successional Areas, and Adaptive Management Areas.

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Mitigation measures ~ Modifications of actions taken to: (1) avoid impacts by not taking a certain action or parts of an action; (2) minimize impacts by limiting the degree or magnitude of the action and its implementation; (3) rectify impacts by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or, (5) compensate for impacts by replacing or providing substitute resources or environments.

Monitoring ~ A process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

“National Environmental Policy Act” (NEPA) ~ An Act passed in 1969 to declare a national policy that encourages productive and enjoyable harmony between humankind and the environment, promotes efforts that prevent or eliminate damage to the environment and biosphere, stimulates the health and welfare of humanity, enriches the understanding of the ecological systems and natural resources important to the nation, and establishes a Council on Environmental Quality.

“National Forest Management Act” (NFMA) ~ A law passed in 1976 as an amendment to the “Forest and Rangeland Renewable Resources Planning Act,” requiring preparation of forest plans and the preparation of regulations to guide that development.

Northwest Forest Plan ~ Coordinated ecosystem management direction incorporated into land and resource management plans for lands administered by the BLM and the FS within the range of the northern spotted owl. In April 1993, President Clinton directed his cabinet to craft a balanced, comprehensive, and long-term policy for management of over 24 million acres of public land within the range of the northern spotted owl. A Forest Ecosystem Management Assessment Team (FEMAT) was chartered to develop a series of options. These options were modified in response to public comment and additional analysis and then analyzed in a final SEIS. A record of decision was signed on April 13, 1994, by the Secretaries of the Department of Agriculture and the Department of Interior to adopt “Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.” The record of decision, including the “Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl” is referred to as the Northwest Forest Plan. The Northwest Forest Plan is not a plan in the agency planning regulations sense; the term instead refers collectively to the 1994 amendment to existing agency land and resource management plans or to the specific standards and guidelines for late-successional species incorporated into subsequent land and resource management plans.

Noxious weed ~ A plant species that is highly injurious or destructive and has a great potential for economic impact; a plant species that is listed as noxious by the State of Oregon.

Off-highway vehicle ~ Any motorized vehicle capable of, or designed for, travel on land, water, or natural terrain. The term will be used in place of off-road vehicle to comply with the purposes of Executive Orders 11644 and 11989 (although the definition for both terms is the same).

Old-growth forest ~ An ecosystem distinguished by old trees and related structural at-

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tributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics which may include tree size, accumulations of large dead woody material, number of canopy layers, species, composition, and ecosystem function. More specific parameters applicable to various species are available in the 1993 “Interim Old Growth Definitions” (USDA-FS Region 6). The Northwest Forest Plan SEIS and FEMAT describe old-growth forest as a forest stand usually at least 180- to 220-years old with moderate-to-high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground.

Pathogen ~ A parasite able to cause disease in a particular host or range of hosts.

Plant association ~ A plant community type based on land management potential, successional patterns, and species composition.

Prescribed fire ~ Any fire ignited by management actions to meet specific objectives.

Prevent ~ As in prevent new infections: An objective, not a requirement.

Record of decision ~ A document separate from, but associated with, an environmental impact statement that: (1) states the management decision; (2) states the reason for that decision, (3) identifies all alternatives including the environmentally preferable and selected alternatives; and (4) states whether all practicable measures to avoid environmental harm from the selected alternative have been adopted, and if not, why not.

Reforestation ~ The natural or artificial restocking of an area with forest trees.

Resistant ~ Possessing qualities that hinder the development of a given pathogen.

Riparian ~ Pertaining to areas of land directly influence by water. Riparian areas usually have visible vegetative or physical characteristics reflecting this water influence. Streamsides, lake borders, or marshes are typical riparian areas. Vegetation bordering watercourses, lakes, or swamps; it requires a high water table. In the FSEIS, sometimes used as substitute for “high-risk sites,” although the two are not synonymous (see text of respective FSEIS sections).

Riparian area ~ The shoreline zone including floodplains, along a stream or lake, affected by varying levels of subsurface water storage conditions; favoring water tolerant plants and forest vegetation. This linear geographic area is oftentimes extended upslope to include the direct influence of forest trees or to a transitional area between aquatic and terrestrial communities.

Riparian Reserves ~ Areas along live and intermittent streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. Riparian Reserves are important to the terrestrial ecosystem as well, serving as dispersal habitat for certain terrestrial species.

Sanitation ~ Removal of POC from infested areas along roads, trails, or around uninfested

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POC to prevent spores from being generated and reaching nearby uninfested stands, or roads where they could be picked-up by passing traffic. Also removal of POC from uninfested areas along roads, trails, or around infested areas to prevent spores falling off vehicles or originating from the nearby infested areas from reaching a host and thereby spreading the disease.

Seed zone ~ A seed zone is an area where seed can be moved from a source or seed collection location to a planting location. General adaptation over the long term is inferred within the movement or seed transfer within the respective zone. Most seed zones have a set geographic area where movement is restricted to specific elevation bands (300 meters).

7th field watershed ~ A delineated hydrologic unit depicting the location of a drainage area that is typically 1,000 to 10,000 acres in size; the 7th division level of the Nation's drainages; represented by extending the hydrologic unit code to 14 digits (Source: [http://www.reo.gov/gis/projects/watersheds/Data\\_Standards2.htm](http://www.reo.gov/gis/projects/watersheds/Data_Standards2.htm)).

6th field watershed ~ A delineated hydrologic unit depicting the location of a drainage area that is typically 10,000 to 40,000 acres in size (it can be as small as 3,000 acres); the 6th division level of the Nation's drainages; represented by extending the 10-digit hydrologic unit code to 12 digits (Source: <http://www.ga.usgs.gov/gis/iag.html> and [http://www.reo.gov/gis/projects/watersheds/Data\\_Standards2.htm](http://www.reo.gov/gis/projects/watersheds/Data_Standards2.htm)).

Snag ~ A standing dead tree.

Species ~ A class of individuals having some common characteristics or qualities. In these Standards and Guidelines, synonymous with taxon, which may include subspecies, groups, or guilds.

Spore ~ A general term for a reproductive structure in fungi, bacteria, oomycetes, and cryptogams (analogous to the seed of a green plant).

Stand (tree stand) ~ An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition to be distinguishable from the forest in adjoining areas.

Standards and guidelines ~ The rules and limits governing actions, as well as the principles specifying the environmental conditions or levels to be achieved and maintained; synonymous with measures and management direction.

Supplemental environmental impact statement (SEIS) ~ As defined by NEPA, a supplement to an existing EIS is prepared when: (1) the agency makes substantial changes to the proposed action that are relevant to environmental concerns; (2) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts; or, (3) the agency determines that the purposes of NEPA would be furthered by doing so.

Surfaced roads ~ Rocked or paved roads.

Ultramafic ~ Igneous rocks composed chiefly of mafic minerals such as augite or olivine. A

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## **Appendix R-8**

### **Visual Resource Analysis, Coos Bay, Roseburg and Medford Districts BLM**

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Jordan Cove Natural Gas Liquefaction and  
Pacific Connector Gas Pipeline Project

**Final** EIS

**Appendix R-8**

**Visual Resource Analysis**

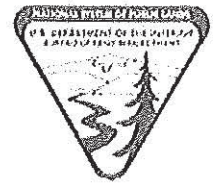
**Coos Bay, Roseburg and Medford Districts and Klamath Falls  
Resource Area of the Lakeview District, Bureau of Land Management**

Prepared by:

**USDI Bureau of Land Management**



## United States Department of the Interior



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IN REPLY REFER TO:  
2880 (ORM050)  
OR-63542  
FERC Docket CP13-492-000

### Memorandum

To: Loraine Salas, PCGP Project Manager

From: Jon Raby, Butte Falls Field Manager  
Don Holmstrom, Klamath Falls Field Manager

Subject: Visual Resources Analysis

This memo is to clarify and summarize the visual resources analysis of BLM lands for the Pacific Connector Gas Pipeline project.

Staff review of the June 2013 Resource Report No. 8 verifies that the inaccuracies of the previous versions have been corrected, and it now accurately describes the visual impacts of the PCGP.

Professional assessments of the project's impacts were done by Recreation Planners in the Coos Bay, Roseburg, Medford and Klamath Falls offices at several Known Observation Points (KOPs) in sensitive viewsheds. Although the project will not fully meet the VRM Class II objectives in the short-term at the Trail Post Office KOP (Butte Falls Resource Area) or on the BLM portion of Clover Creek Road (Klamath Falls Resource Area), Class II objectives at those locations will be met in the long-term by using mitigation efforts described in the January 2013 Aesthetics Management Plan.

Using guidance from the Aesthetics Management Plan for these and other sensitive viewsheds along the PCGP will reduce visual impacts to the point that land use plan amendments of the Medford District and Klamath Falls RMPs are not necessary for the project. The project does not meet VRM Class II objectives in the short-term (less than 5 years) at these two locations, but plan amendments are not needed because the areas in question are very short, and mitigation developed in the Aesthetics Management Plan will help the areas reach VRM Class II objectives in the long term (5-10 years).

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## **Appendix R-9**

### **PCGP Forest Service Visual Management Mitigation Analysis**

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# **PCGP Forest Service Visual Management Mitigation Analysis**

## **Pacific Connector Gas Pipeline Scenery Management Analysis and Mitigation Recommendations**

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Prepared by  
Donna M. Mattson  
Consulting Landscape Architect, US Forest Service  
August 10, 2015

The Pacific Connector Gas Pipeline (PCGP) project traverses three National Forests along its route from Coos Bay to Klamath Falls. These Forests use the Visual Management System, (VMS) to manage the visual resources and to analyze visual effects of proposed projects. The VMS uses a rating system known as Visual Quality Objectives, (VQO) to establish standards for scenery resource management.

The Visual Management System, Handbook 462 was published in 1974. Since then, Handbook 701 updates the most current Forest Service direction for scenery management. The Landscape Aesthetics, Scenery Management System utilizes a very similar rating system as the VMS that is used to evaluate project impacts to the visual quality. In addition, an appendix has been adopted as part of this direction to address the stability of scenic attributes as well as the direct visual effects of a project. Appendix J utilizes a scenic stability indicator to rate the stability of scenic attributes and how a project will affect that stability. The three Forests involved in the PCGP planning process and route identification efforts have not formally adopted the Scenery Management System as Forest Plan standards. However, the direction to the Forest Service has been, since 1996, to incorporate the new system as we work on new projects. This analysis will utilize the existing visual quality objectives established in the land and resource management plans for the Rogue River, Winema and Umpqua National Forests, as well as apply the scenic stability indicator of Appendix J to address the conditions and trends that may place the scenery attributes and the proposed and recommended restoration efforts at risk.

The proponent's Aesthetics Management Plan for Federal Lands (AMP) included as attachment A to their Plan of Development proposes restoration efforts and some minimal mitigation measures that broadly address the effects to scenery. However, where the route is in areas where the Visual Quality Objective is partial retention or retention these measures will not meet these objectives within the target time frame. This analysis has examined these areas and the proposed mitigations within the proponent's AMP and shows why that plan, as proposed is insufficient and would not comply with Forest Service objectives for visual resources.

## **PCGP Forest Service Visual Management Mitigation Analysis**

This analysis looks at the proponents AMP, and then makes recommendations for mitigation measures recommended to improve the restoration and mitigation efforts and determines what VQO would be met.

The PCGP project route traverses National Forest System (NFS) lands in areas that have very rocky and porous soils. It is expected that restoration efforts related to revegetation may require lengthy periods of time to meet the visual quality objectives. This is particularly true on the eastern side of the Cascade Range where rainfall is significantly less, the temperatures are colder and the species selection for revegetation is more limited.

### **PCGP Project Effects Incorporating the AMP**

#### **Construction Effects**

The construction of this gas pipeline will require a 95 to 75 foot construction corridor for placement of the pipe itself. Additionally, temporary work areas (TEWAs) and uncleared storage areas (UCSAs) will be used at locations parallel to the actual pipeline excavation and laydown area. The construction and associated TEWAs would be cleared and graded to a level surface to provide a safe and stable work area. At the edges of this construction zone, the UCSAs will be used to store equipment during construction as well as excess boulders and root wads. The clearing of the right-of-way will create a sharp edged linear feature across a contiguously forested landscape. A ditch zone of 10' will be excavated for placement of the pipe while all tree stumps and shrubs will be removed except where specific design criteria specifies otherwise. (See PCT crossing site) The excavation will expose subgrade soils that will contrast with the color of the forest canopy. It is expected that the amount of boulders and root wads will be excessive in this landscape making it difficult to dispose of in a manner that will not affect scenery. Boulders scattered on top of the ground do not appear natural and root wads with cut stumps are very distracting if found in more than occasional amounts. The compaction of soils and loss of topsoil caused by construction equipment will affect the success of proposed revegetation.

#### **Right-of-way Maintenance Effects**

A thirty foot corridor centered directly above the pipeline shall be maintained for the fifty year life of the pipeline by removing trees greater than 15 feet and vegetation greater than 6 feet in height. Depending on the methods of clearing, the effects could be similar to road brushing which uses a thrashing technique that leaves a rough brushed appearance immediately after clearing. The 30 foot corridor, once the construction zone is revegetated and allowed to rehabilitate; will appear as a linear feature that is incongruent with natural terrain or even typical corridors such as roads that gradually climb the side hill rather than rise directly up a slope.

## **PCGP Forest Service Visual Management Mitigation Analysis**

The construction techniques proposed by the proponent in designated visually sensitive areas are as follows:

- a. Strategically place construction debris (slash, boulders, stumps,
- b. Shape and blend the right of way to the extent practicable to conform with preconstruction contours and the characteristic landscape
- c. Rock and log barriers used to prevent passage of OHV's.
- d. Utilize rock and boulder material generated during construction as trench backfill material where appropriate.
- e. Utilize storage methods to ensure enhancement and mitigation of visual resources along the right of way to the extent they are practicable and safe.
- f. Revegetate all disturbed areas and replant trees in temporary extra work areas (TEWAs) that were previously forested.

### **Specific Mitigation for Key Observation Points**

#### **Big Elk Road (MP 161.41)**

- a. "Neck-down" construction zone across road from 95' to 50'
- b. Route shall cross directly perpendicular to the road
- c. Revegetate with native trees, shrubs, and plants
- d. Plant a row or cluster of trees and/or shrubs across the right of way to provide visual screens at key road and trail crossings in sensitive viewsheds.
- e. Shorten the potential visual corridor by turning the corridor on both sides of the crossing
- f. UCSA's eliminated within "necked-down" zones.

#### **Pacific Crest Trail (PCT)**

- a. "Reduced width of the corridor clearing to 75' for a length 300' from the centerline of the trail in both directions.
- b. No grading of the corridor within the 75' neckdown segments below existing ground elevation to retain topsoil & shrubs with the exception of the 10' wide ditch zones.
- c. The duff layer (O horizon and A horizon) of the ditch zone stripped, segregated, and stored, then laid down after backfilling.
- d. Use of timber mats during construction on the working-side of the 10' wide ditch zones to protect soils and shrubs.
- e. Retain shrubs within the neckdown segments by mowing to six inches in height and protect vegetation with timber mats.
- f. Hydro-mulch seeding of all disturbed soils.
- g. On-site shrubs and ground cover plants dug from the 10' wide ditch zone, heeled-in root balls in a safe storage location, and then transplanted back into the trench zone.
- h. Duff placed with rubber-tracked equipment to avoid compaction, and hand crews rake the material out. Nursery trees planted along the edges in a scalloped arrangement.

## **PCGP Forest Service Visual Management Mitigation Analysis**

- i. Logs and fallen trees placed in the corridor consistent with Forest Service direction.
- j. Drip irrigation system for 5 years after completion of the construction phase, and replacement of mortality that exceeds 30 percent.
- k. Plant nursery stock trees ranging from 5 to 12' in height along corridor edge in a scalloped and irregular manner.
- l. Root prune and transplant trees in a scalloped and irregular manner along corridor edge.

### **Dead Indian Memorial Road**

- a. "Neck-down" construction zone from 95' to 75' across the road
- b. UCSA's eliminated within "necked-down" zones.
- c. Shorten the potential visual corridor by turning the corridor on both ends of the crossing
- d. Plant a row or cluster of trees and/or shrubs across the right of way to provide visual screens at road crossing
- e. Revegetate with native trees, shrubs, and plants
- f. Place barrier to discourage Off-highway vehicle use

### **Clover Creek Road**

- a. Relocate Block Valve 12 (this was done prior to FEIS)
- b. Regrade to approximate original contour
- c. Reseed construction right-of-way (ROW) area
- d. Scatter slash across the right of way
- e. Replant with seedlings

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## **Site Specific Analysis of Affects on Scenery Resources**

### **Big Elk Road Crossing**

#### **Forest Plan Standards**

VQO- Foreground Retention

#### **Visibility**

The pipeline crosses Big Elk Road (FS RD 37) in a west-east alignment which runs through a mixed conifer forest. The route would be viewed from a foreground distance; however, the duration of the view is very short for those traveling on the highway at an average speed of 50mph. The broad 75' construction swath perpendicular to the road will attract the eye because of the existing vegetation that creates a tunnel effect along the roadway. The visual effect of a cleared corridor will be similar to an intersecting road. The corridor will be the single deviation from the contiguous edge of the timber along the road.



## **PCGP Forest Service Visual Management Mitigation Analysis**

### **Visual Absorption Capability**

The heavy timber canopy is very contiguous, decreasing the visual absorption capability. The terrain is very flat in this area. The view of the ROW is limited by the width and depth to which the viewer can see down the ROW. The visual absorption capability is not a factor in immediate foreground viewing situations.

### **Visual Effects**

The immediate visual effects created by the ROW will be a strong linear feature with strong edges at each side. The color contrast of the exposed soils will be evident, and the scale of the opening will be uncharacteristic to the surrounding landscape. The berm, boulders, and root wads created to block OHV users from accessing the site will draw attention to the corridor as these negative elements detract from the natural appearing landscape.

### **Seasonal Changes**

The ROW corridor will be most evident in the winter when the snow creates the strongest contrast to the coniferous forest. Spring, summer, and fall will be similar in effects other than the changing color of the seeded grasses and shrubs.

### **Expected Results of Proposed Mitigation**

The immediate effects of the PCGP corridor to the visual resource are unacceptable modification. The 75' swath with the tall adjacent tree line edges will be uncharacteristic to the surrounding landscape. A small cluster of trees with a height less than 40' will not screen the open swath created by the corridor. The logs and boulders proposed to be strewn across the PCGP are unacceptable. Placing root wads in the UCSAs is an unacceptable practice in all areas that are visible, regardless of the sensitivity level. After the grasses and shrubs begin to grow, the soil color contrast will be reduced as the exposed soils are covered. Shrubs will add texture and color variation to the flat plane.

It is expected that creating openings at this location will cause frost pockets and hamper revegetation efforts. Revegetation could take as long as 20-30 years if successful at all. This is seen in strip cut harvests in the area that have taken 30 years to revegetate. Once the PCGP corridor is revegetated the cleared width will be reduced to a minimum of 30 feet in width. The expected results of the proponents restoration efforts will eventually meet modification, but not within five years. It is expected that it could take 20 to 30 years to fully revegetate and at that time the PCGP project is expected to meet partial retention.

# **PCGP Forest Service Visual Management Mitigation Analysis**

## **Forest Service Mitigation Measures**

### **Potential/Recommended Forest Service Mitigation Measures**

The following mitigation measures shall be done in the construction ROW and TEWAs from the edge of Big Elk Road to where the corridor makes the turn and is no longer visible from the Big Elk Road.

#### **1.0 Soil Color Contrast Mitigation**

##### **1.1 Chip slash to:**

- a. mulch ROW to manage slash production;
- b. reduce soil erosion; and
- c. retain soil moisture to increase revegetation success.

1.2 Where using hydro-mulch to avoid erosion, use colorant (commercially available) dark brownish green to reduce color contrast.

#### **2.0 Edge/Form Mitigation**

2.1 Scallop edges by removing trees in areas designated by the Forest Service landscape architect in consultation with Pacific Connector's Environmental Inspector(s) to reduce the straight linear edge, and change shadow cast patterns.

2.2 Feather edges of ROW by cutting some tall trees (40'+) along the immediate edge, leaving trees with heights of 10-40' in height for a distance of 50-100'. Feathering shall be done in accordance to advisement of Forest Service landscape architect and in coordination with Pacific Connector's EI(s).

#### **3.0 Revegetate for Reduction of Width and Improving Form**

3.1 Transplant trees of 15' to 20' height into the ROW in clusters by using a tree spade to immediately reduce the sharp linear edge, and break up the wide barren swath. Transplant 15- 20 trees per 1/8<sup>th</sup> mile to blend the corridor into existing tree densities, in accordance to advisement of Forest Service landscape architect and in coordination with Pacific Connector's EI(s).

#### **4.0 Treatment of TEWAS in highly visible areas**

4.1 Transplant trees into the TEWAS in clusters by using a tree spade. Combine with partially buried (1/3-1/2 recess) boulders to create groupings for wildlife use and to appear more natural.

4.2 Treat compacted soils by sub soiling to aerate the soils where necessary as discussed in the ECRP, Section 10.

#### **5.0 Root wad and Boulder Placement in Immediate Foreground**

## **PCGP Forest Service Visual Management Mitigation Analysis**

5.1 Every effort shall be made to bury all root wads and boulders within the ROW.

5.2 Boulders larger than one foot in diameter that are placed in the immediate foreground (300') shall be partially buried to approximately 1/3 the height of the boulder. Root wads (that cannot be buried) and boulders within the foreground shall be placed in groupings of approximately 3 root wads and 2 boulders. There shall be no more than about one grouping per 1/8<sup>th</sup> mile within Retention areas or Class I areas. In partial retention areas/Class II areas there shall be approximately 3 groupings per 1/8<sup>th</sup> mile. See Diagram C – Linear Guideline Template for typical construction. All mitigation measures shall be constructed under the on-site advisement of Forest Service landscape architect in consultation with Pacific Connector's EI(s) during the time of construction.

### **6.0 Treatment of Soil Compaction**

6.1 Subsoiling and other soil compaction mitigations shall occur in areas determined necessary as per the ECRP to reduce soil compaction and to improve success of revegetation efforts.

### **7.0 Planting Shrubs**

7.1 Plant 1-2 gallon sized shrubs and protect with plant guards. This will reduce the soil contrast and the single plane of the open forest floor. Plant as designated on the site plan for the immediate foreground of the site.

### **8.0 Blocking from OHV use**

8.1 Construct a berm with boulders to discourage access from OHV use.

### **9.0 Screening**

9.1 Modify the view of the corridor for the viewer by leaving specific trees near the roadway that can be worked around, and transplanting trees of 10-15ft height in groupings in the immediate foreground, as designated by the Forest Service landscape architect and in coordination with Pacific Connector's EI(s).

### **11.0 Plant deciduous trees and shrubs for fall color.**

11.1 Plant willow, ceanothus, ribes, huckleberry, chinquapin as specified in the ECRP.

## **PCGP Forest Service Visual Management Mitigation Analysis**

### **Site Specific Design Mitigations**

See section with diagrams.

### **Expected Results of Recommended Mitigation**

The expected result of the recommended mitigations is that the visual quality level may be partial retention in 10 years if revegetation efforts and mitigations are successful. The Scenery Management System does not specify a timeframe for meeting Retention or High Scenic Integrity; however the Visual Management System requires that Retention VQO be met during or immediately after project completion.

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### **Dead Indian Memorial Road Crossing**

#### **Forest Plan Standards**

VQO- Foreground Retention

#### **Visibility**

The pipeline crosses Dead Indian Memorial Road (FS RD 37) in a west-east alignment which runs through a lodge pole ecotone vegetation type. The route would be viewed from a foreground distance; however, the duration of the view is very short. The broad 75' construction swath will attract the eye because the existing vegetation that creates a tunnel effect along the roadway. The northwest pipeline alignment bends approximately 600' from the edge of the road reducing the sight line distance down the corridor.

#### **Visual Absorption Capability**

The heavy timber canopy is very contiguous, decreasing the visual absorption capability. The terrain is very flat in this area. The view of the ROW is limited by the width and depth to which the viewer can see down the ROW.

#### **Visual Effects**

The immediate visual effects created by the ROW will be a strong linear feature with strong edges at each side. The color contrast of the exposed soils will be evident, and the scale of the opening will be uncharacteristic in the surrounding landscape. The proposed berm, boulders, and root wads created to block OHV users from accessing the site will draw attention to the corridor as these negative elements detract from the natural appearing landscape. This crossing will also likely create a 'daylight' cut into the cut bank along the edge of the road. This cut will also attract the eye to the corridor.

#### **Seasonal Changes**

The ROW corridor will be most evident in the winter when the snow creates the strongest contrast to the coniferous forest. Spring, summer, and fall will be

## **PCGP Forest Service Visual Management Mitigation Analysis**

similar in effects other than the changing color of the seeded grasses and shrubs.

### **Expected Results of Proposed Mitigation**

The immediate effects of the ROW corridor are unacceptable modification. The 75' swath with the tall adjacent tree line edges will be uncharacteristic to the surrounding landscape. The proposed logs and boulders strewn across the ROW are unacceptable. Placing root wads in the uncleared storage areas is an unacceptable practice in all areas that are visible. After the grasses and shrubs begin to grow, the soil color contrast will be reduced as the exposed soils are covered.

It is expected that creating openings at this location will cause frost pockets and hamper revegetation efforts. Revegetation could take as long as 20-30 years if successful at all. This is seen in strip cut harvests in the area that have taken 30 years to revegetate. Once this occurs the cleared ROW will be reduced to a minimum of 30 feet width. These practices will eventually meet modification, but not within five years.

The Winema National Forest VQO in this area is foreground retention. This proposal does not meet this objective, and is never expected to meet it, although there will be a filling in of vegetation and softening of appearance overtime.

### **Forest Service Mitigation Measures**

#### **Recommended Forest Service Mitigation Measures**

The following mitigation measures shall be done in the construction ROW and TEWA(s) from the edge of Dead Indian Memorial Road to 600 feet beyond the immediate foreground.

#### **1.0 Soil Color Contrast Mitigation**

##### **1.1 Chip slash to mulch ROW to:**

- a. manage slash production;
- b. reduce soil erosion; and
- c. retain soil moisture to increase revegetation success.

1.2 Where using hydro-mulch to avoid erosion, use colorant (commercially available) dark brownish green to reduce color contrast.

#### **2.0 Edge/Form Mitigation**

2.1 Scallop edges by removing trees in designated areas to reduce the straight linear edge, and change shadow cast patterns.

2.2 Feather edges of ROW by cutting tall trees (40'+) along the immediate edge, leaving tree heights of 10-40' for a distance of 50-100'. Feathering

## **PCGP Forest Service Visual Management Mitigation Analysis**

shall be done in accordance to advisement of Forest Service landscape architect and in coordination with Pacific Connector's EI(s).

### **3.0 Revegetation for Reduction of width and improving form**

3.1 Transplant trees into the ROW in clusters by using a tree spade to immediately reduce the sharp linear edge, and break up the wide barren swath.

### **4.0 Treatment of TEWAS in Scenic Areas**

4.1 Transplant trees that are root pruned a year in advance, into the TEWAS in clusters by using a tree spade. Combine with boulders to create groupings for wildlife use and to appear more natural.

### **5.0 Root wad and Boulder Placement in Immediate Foreground**

5.1 Every effort shall be made to bury all root wads and boulders within the ROW.

5.2 Root wads and boulders placed in the immediate foreground (300') should be partially buried to approximately 1/3 the height of the boulder and 1/3 the height of the root wad. Cut faces should be directed away from the viewer platform, or concealed by boulders or berms. Root wads and boulders shall be placed in groupings of approximately 3 root wads and 2 boulders. There shall be about one grouping per 1/8<sup>th</sup> mile within Retention areas or Class I areas. In partial retention areas/Class II areas there shall be approximately 3 groupings per 1/8<sup>th</sup> mile. See Diagram C – Linear Guideline Template for typical construction. All mitigation measures shall be constructed under the on-site advisement of Forest Service landscape architect and in coordination with Pacific Connector's EI(s) during the time of construction.

### **6.0 Treatment of Soil Compaction**

6.1 Subsoiling and other soil compaction mitigations shall occur in areas determined necessary as per the ECRP Section 4.2.3 to reduce soil compaction and to improve success of revegetation efforts.

### **7.0 Planting Shrubs**

7.1 Plant 1-2 gallon size shrubs and protect with plant guards, in order to decrease the amount of time needed to address soil contrast and the single plane of the open forest floor. Plant as directed by the Forest Service landscape architect and in coordination with Pacific Connector's EI(s).

### **8.0 Blocking from OHV use**

8.1 Construct a berm with partially recessed boulders to discourage the access from OHV use. Construct as designated by the Forest Service landscape architect and in coordination with Pacific Connector's EI(s).



## **PCGP Forest Service Visual Management Mitigation Analysis**

### **9.0 Screening**

9.1 Screen the corridor from the viewer by leaving specific trees near the roadway that can be worked around, and transplanting trees of 15-20ft height in groupings in the immediate foreground, as designated by the Forest Service landscape architect.

### **10.0 Plant deciduous trees and shrubs for fall color.**

10.1 Plant willow, ceanothus, ribes, huckleberry, chinquapin as designated in the ECRP.

### **11.0 Reconstruct the cut bank**

11.1 Recontour the cut bank to discourage OHV access, and to reduce the distractive effect of to the edge of the roadway as advised by Forest Service landscape architect and in coordination with Pacific Connector's EI(s).

### **12.0 Scenic Stability**

12.1 Fund off-site mitigation actions for Forest Service project work related to design, NEPA, and implementation of thinning and a fuel break along the highway. This project would thin trees in a variable transition zone 50 to 500 feet in width along the highway, to reduce tree density, fuel loadings, and percent of canopy closure appropriate to the species. This mitigation project would open up the stands and reduce the risk of losing existing scenic attributes, and recommended mitigation efforts in the event of a large stand replacement fire.

### **Expected Results of Mitigation to Meet Partial Retention VQO**

The expected result of the recommended mitigations is that the visual quality level may be Partial Retention in 10 years if revegetation and mitigations are successful. The Scenery Management System does not specify a timeframe for meeting Retention or High Scenic Integrity; however the Visual Management System requires that Partial Retention VQO be met during the first year or immediately after project completion.

### **Mitigations to Meet Retention VQO**

The forest plan standard for this area is Foreground Retention. This means that impacts are not visually evident from a foreground view.

The pipeline would have continued effects of a 30' overstory strip opening, meaning that for a distance of 600ft in one direction and 600ft in the other there will be an open sky strip. This is due to the removal of trees over 15ft and shrubs over 6ft. Because this strip is retained through out the existence of the pipeline in

## **PCGP Forest Service Visual Management Mitigation Analysis**

this location, retention would not ever be met; given the recommended mitigation measures within and along the edge of the ROW.

Granted this strip would be seen from a moving car only for a short period of time, but the Visual Management system does not address duration of the view of an impact, other than to consider duration in the scenic class inventory. Due to the sensitivity level of this road, along with the scenic attractiveness and viewed distance, this area was assigned a Retention VQO in the Forest Plan standards and guidelines.

The recommended visual mitigation calls for softening the strip effect by scalloping and feathering the edges (2.1 and 2.2). This would soften the effect but would not make the strip “not visually evident”. In order to meet retention, the strip effect must be addressed. Address meaning make it “not visually evident”. To do this the surrounding timbered area would need to be sufficiently “opened up” to allow the open sky to be visible to the viewer traveling along this route, so that when the viewer drives by the crossing the open sky is not differing from the visual experience provided on either side of the crossing. So, this would be a designed project that would create a gradual thinning that increased the open sky view as the viewer approached the crossing point until the opening sky view was no longer a strip within a contiguous forest, but just an open sky view afforded to the viewer that does not appear unnatural in form, line, color, and texture. This is a project that could occur beyond the ROW, probably a ¼ to ½ mile each direction of the crossing point, and for a 600ft on both sides of the road. This kind of project could mimic a natural occurrence such as an insect and disease opening that often occurs in this lodge pole vegetation type. Over time this type of thinning would have to be maintained or the contiguous forest would “come back”, and the strip over the pipeline would once again become visually evident. This type of treatment could also be considered in the form of a fuel break, which would be considered, within appendix J of the SMS an action that could improve scenic stability by reducing the potential breadth of a stand replacement fire to a scale that is within the natural range of variability.

If this type of approach was included in the chosen alternative, then retention could be met as soon as soil color contrast mitigation was successful, and transplanted trees within the 75' corridor reached 20ft in height. The transplanted tree density would need to mimic the modified basal area of the surrounding area to blend the corridor into the landscape. Retention would not be met immediately nor within a year or one growing season, but it could eventually be met.

### **Pacific Crest Trail Crossing**

#### **LRMP Standards**

VQO- Foreground Partial Retention

#### **Visibility**

The PCGP ROW crosses the Pacific Crest Trail within late successional reserve timber, where large trees are the prominent visual element. The perpendicular crossing will create a 75' clearing across the trail which is currently an 8-10' corridor. The ROW clearing is excessively out of scale in this landscape, especially when experienced on foot. The clearing will extend for approximately .8 miles in both directions.

#### **Visual Absorption Capability**

There is no absorption capability that will lessen the visibility of this proposed right of way and its effects. The contiguous forest is a landscape in which a corridor ROW cannot be absorbed. There are no similar features that would help absorb the impacts of such a linear feature.

#### **Visual Effects**

The immediate visual effects include soil color contrast to existing adjacent vegetation, excessive vegetative clearing uncharacteristic in width and breadth, hard, linear edges, proposed distribution of extensive root wads, and boulders in the uncleared storage areas.

The planned logs and boulders strewn across the ROW will be very unnatural appearing even when the grasses and shrubs grow up. As trees grow to a height of 20 feet, the edges will begin to soften as tree boughs will begin to blend with adjacent trees, and the width of the vegetatively cleared ROW will eventually be reduced to 30 feet.

#### **Seasonal Changes**

The ROW corridor will be most evident in the winter when the snow creates the strongest contrast to the coniferous forest. Spring, summer, and fall will be similar in effects other than the changing color of the seeded grasses and shrubs.

#### **Expected Results of Proposed Mitigation Measures**

The immediate effects of the cleared ROW corridor are unacceptable modification.

It is expected that the broad linear opening will create an excessive amount of visual disturbance. The effects proposed activity are visually unrelated to those in this characteristic landscape. Seeding and transplanting will not be successful

## **PCGP Forest Service Visual Management Mitigation Analysis**

in blending the proposed changes within the foreground view with the existing landscape until the ground vegetation is restored; the hard linear edges of the clearing are softened. It is expected that the proposed mitigation measures will be successful in achieving modification within five years. Opening the forest canopy up like this may create a frost pocket that will be difficult to revegetate in a timely manner, therefore nursery stock, transplanting existing shrubs and irrigation is necessary.

### **Proposed/Recommended Forest Service Mitigation Measures**

The following mitigation measures shall be done in the construction ROW and TEWA(s) from the edge of the PCT to where the corridor makes the turn and is no longer visible from the PCT.

#### **1.0 Soil Color Contrast Mitigation**

1.1 Chip slash to mulch the cleared ROW to:

- a. manage slash production
- b. reduce soil erosion
- c. retain soil moisture to increase revegetation success.

1.2 Where using hydro-mulch to avoid erosion, use colorant (commercially available) dark brownish green to reduce color contrast.

#### **2.0 Edge/Form Mitigation**

2.1 Scallop edges by removing trees in designated uncleared storage areas to reduce the straight linear edge, and change shadow cast patterns.

2.2 Feather edges of ROW by cutting tall trees (40'+) along the immediate edge, leaving trees of heights at 10-40' in height for a distance of 50-100' to graduate the edge from mid-sized to full height. Feathering shall be done in accordance to advisement of forest service landscape architect and in coordination with Pacific Connector's EI(s).

#### **3.0 Revegetate for Reduction of width and improving form**

3.1 Plant nursery stock trees of 10' to 15' height into the ROW in clusters by using a tree spade to immediately reduce the sharp linear edge, and break up the wide barren swath.

#### **4.0 Treatment of TEWAS in highly visible areas**

4.1 Plant nursery stock trees of 10' to 15' height into the ROW in clusters by using a tree spade to immediately reduce the sharp linear edge, and break up the wide barren swath. Combine trees with groupings of boulders to create clumps for wildlife use and to appear more natural.

#### **5.0 Root wad and Boulder Placement in Foreground**

## **PCGP Forest Service Visual Management Mitigation Analysis**

5.1 Every effort shall be made to bury all root wads within the pipeline ROW where visible from the trail.

5.2 Root wads shall not be placed in the immediate foreground (300'). Those placed within the foreground should be partially buried to approximately 1/3 the height of the root wad. Cut faces should be directed away from the viewer and cut ends concealed with soil and boulder placement. Root wads and boulders shall be placed in groupings of approximately 2 root wads and 3 boulders. There shall be about one grouping per 1/8<sup>th</sup> mile within Retention areas or Class I areas. In partial retention areas/Class II areas there shall be approximately 3 groupings per 1/8<sup>th</sup> mile. See Diagram C – Linear Guideline Template for typical construction. All mitigation measures shall be constructed under the on-site advisement of a scenery specialist during the time of construction.

### **6.0 Treatment of Soils, Forbs and Shrubs**

6.1 Timber mats shall be used on the working side of the ditch zone to reduce soil compaction and save the existing forb and shrub layer.

6.2 Subsoiling and other soil compaction mitigations shall occur in areas determined necessary as per the ECRP Section 10 to reduce soil compaction and to improve success of revegetation efforts.

6.3 The corridor shall not be stripped or graded outside of the ditch zone. Shrubs shall be mown to a 6" height and trees shall be flush cut. Protect vegetation with timber mats.

6.4 On site shrubs and ground cover plants dug from the 10' wide ditch zone, heeled in root balls in a safe storage location, and then transplanted back into the trench zone.

6.5 The duff layer (O and A horizon) of the ditch zone shall be stripped, segregate, and stored, then laid down after backfilling. Duff shall be placed with rubber-tracked equipment to avoid compaction, and hand crews shall rake the material out.

### **7.0 Planting Shrubs**

7.1 Plant 1-2 gallon size shrubs and protect with plant guards to decrease the amount of time needed to address soil color contrast and the single plane of the open forest floor. Plant shrubs of varying sizes and species in groupings of 5 to 8.

7.2 Plant transplanted and root balled shrubs back into ROW and irrigate.

7.3 Replacement of all plants that are in exceedance of the 30% mortality criteria.

### **8.0 Plant Nursery Stock Trees and Transplant Trees**

8.1 Plant nursery stock trees along the edges of the corridor to feather and scallop the edges. Trees shall be of varying heights from 5' to 12' in

## **PCGP Forest Service Visual Management Mitigation Analysis**

height and planted in an irregular manner along the edge to create a scalloped appearance.

8.2 Root prune trees in areas designated by Forest Service representative one year in advance, and transplant root pruned trees with tree spade to the ROW edge.

### **9.0 Irrigation<sup>1</sup>**

9.1 Install and maintain a drip irrigation system for 5 years after completion of the construction phase of the project. Irrigate all transplanted and nursery stock shrubs and trees. A water storage tank shall be installed near the nearby cabin, and a line laid to the site for irrigation.

### **10.0 Scalloped Edge Treatment outside the ROW<sup>2</sup>**

10.1 Thin the adjacent timber and scallop the edges of the corridor by removing trees to diminish the linear form of the ROW corridor, as directed by a Forest Service landscape architect.

## **Expected Results of Recommended Mitigation**

The expected result of the recommended mitigations is that the visual quality level would meet a modification visual quality objective within 5 years. The hikers along this trail are very observant and the speed at which they travel will allow them ample time to view the ROW, so it is expected that they will notice more of the effects of the corridor, but the edges will soften by vegetative growth. The corridor will remain evident for the first 5 to 10 years but the immediate impacts will diminish. Plantings will soften the stark contrast of the corridor as they gain height and breadth. The ditch zone soils will quickly return to a color and texture that will blend with the existing ground layer with chip slash and hydro mulching to bring forbs and grasses into view.

The LRMP calls for partial retention within 5 years. This standard is not expected to be achieved within 5 years, however after the adjacent vegetation is treated to scallop the linear edges of the corridor, partial retention is expected to be met shortly after treatments take place. The corridor will be narrower and less linear, being noticeable but subordinate to the characteristic landscape.

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## **Clover Creek Road**

### **LRMP Standards**

VQO- Foreground Partial Retention

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<sup>1</sup> The irrigation System is to be part of the Compensatory Mitigation Plan

<sup>2</sup> Treatment outside of the ROW is to be part of the Compensatory Mitigation Plan



## **PCGP Forest Service Visual Management Mitigation Analysis**

### **Visibility**

The PCGP ROW is located directly adjacent to the Clover Creek Road for over 18 miles. Eight miles of these are NFS lands. The adjacent alignment will increase the apparent roadway corridor width from 54' to 149', almost tripling the existing width. This 95' additional width for the ROW is fully visible in an immediate foreground view. The cumulative effect of the project area across all jurisdictions will dominate the view for the entire 18 miles.

### **Visual Absorption Capability**

There is no absorption capability that will lessen the visibility of this proposed right of way and its effects.

### **Visual Effects**

The immediate visual effects include soil color contrast to existing adjacent vegetation, grossly uncharacteristic scaled opening in width and breadth; hard, linear edge, extensive number root wads, and boulders strewn in the uncleared storage areas.

The logs and boulders strewn across the ROW are unacceptable. Permanently placing root wads in the uncleared storage areas is an unacceptable practice in all areas that are visible. (Pg. 39, National Forest Landscape Management, Vol. 2.) After the grasses and shrubs beginning to grow the soil color contrast will be reduced as the exposed soils are covered. Shrubs will add texture and color variation to the flat plane. As trees grow to a height of 20 feet, the ROW edges will be softened, and the width of the ROW will eventually be reduced to 30 feet. Where adjacent to the 54' roadway, the full opening will be 84'.

### **Seasonal Changes**

The ROW corridor will be most evident in the winter when the snow creates the strongest contrast to the coniferous forest. Spring, summer, and fall will be similar in effects other than the changing color of the seeded grasses and shrubs. Seasonal changes will not make enough difference to note in the foreground, because the scale of the opening and the adjacency to the road makes the effects undifferentiated by seasonal change.

### **Expected Results of Proposed Mitigation Measures**

The immediate effects of the ROW corridor are unacceptable modification. The 95' swath with the tall adjacent tree line edges will be uncharacteristic to the surrounding landscape. The extensive number of logs and boulders strewn across the ROW is unacceptable. Placing root wads in the uncleared storage areas is an unacceptable practice in all areas that are visible. After the grasses and shrubs beginning to grow the soil color contrast will be reduced as the exposed soils are covered. Revegetation could take as long as 20-30 years. Once this occurs the cleared ROW will be reduced to a minimum of 30 feet width. These practices will result in unacceptable modification.

## **PCGP Forest Service Visual Management Mitigation Analysis**

### **Recommended Forest Service Mitigation Measures**

The extensive project activities within immediate foreground of this road require site specific designed mitigation. See the Clover Creek mitigation measures by zone, and the template diagrams.

#### **1.0 Soil Color Contrast Mitigation**

1.1 Chip slash to mulch cleared ROW to: a. manage slash production, b. reduce soil erosion, and c. retain soil moisture to increase revegetation success.

1.2 Where using hydro-mulch to avoid erosion, use colorant (commercially available) dark brownish green to reduce color contrast.

#### **2.0 Edge/Form Mitigation**

2.1 Scallop edges by removing trees in designated areas to reduce the straight linear edge, and change shadow cast patterns.

2.2 Feather edges of ROW by cutting tall trees (40'+) along the immediate edge, leaving trees of heights at 10-40' in height for a distance of 50-100'. Feathering shall be done in accordance to advisement of forest service landscape architect and in coordination with Pacific Connector's EI(s).

#### **3.0 Revegetate for Reduction of Width and Improving Form**

3.1 Transplant trees into the cleared ROW in clusters by using a tree spade to immediately reduce the sharp linear edge, and break up the wide barren swath.

#### **4.0 Treatment of TEWA(s) in highly visible areas**

4.1 Transplant trees into the TEWA(s) in clusters by using a tree spade. Combine with groupings of recessed boulders to create clumps for wildlife use and to appear more natural.

#### **5.0 Root wad and Boulder Placement in Immediate Foreground**

5.1 Every effort shall be made to bury all root wads and boulders within Row clearing.

5.2 Root wads and boulders placed in the immediate foreground (300') should be partially buried to approximately 1/3 the height of the boulder and 1/3 the height of the root wad. Cut faces should be directed away from the viewer and cut ends concealed with soil and or boulders. Root wads and boulders shall be placed in groupings of approximately 3 root wads and 2 boulders. There shall be about one grouping per 1/8<sup>th</sup> mile within Retention areas or Class I areas. In partial retention areas/Class II areas there shall be approximately 3 groupings per 1/8<sup>th</sup> mile. See Diagram C – Linear Guideline Template for typical construction. All

## **PCGP Forest Service Visual Management Mitigation Analysis**

mitigation measures shall be constructed under the on-site advisement of a Forest Service landscape architect and in coordination with Pacific Connector's EI(s) during the time of construction.

### **6.0 Treatment of Soil Compaction**

6.1 Subsoiling and other soil compaction mitigations shall occur in areas determined necessary as per the ECRP Section 4.2.3 to reduce soil compaction and to improve success of revegetation efforts.

### **7.0 Planting Shrubs**

7.1 Plant 1-2 gallon size shrubs and protect with plant guards to decrease the amount of time needed to address soil contrast and the single plane of the open forest floor. Plant as designated by the Forest Service landscape architect and in coordination with Pacific Connector's EI(s).

### **8.0 Screening**

8.1 Screen the corridor from the view by leaving specific trees near the roadway that can be worked around. Transplant trees 15-20ft in height. Construct groupings in the immediate foreground, as designated by the FS Landscape Architect.

### **11.0 Plant deciduous trees and shrubs for fall color.**

11.1 Plant willow, ceanothus, ribes, huckleberry, chinquapin as designated by the ECRP.

## **Specific Site Designed Mitigations by Zone and Topography**

These zones are shown on the template diagrams.

### **Zone A – Uncleared Storage Areas**

This UCSAs are areas not cleared for construction but used for storage of equipment, construction materials and root wads and boulders. This zone is near the edge of the construction corridor where vegetation remains, and where thick forest creates a strong edge or wall. This edge needs to be "feathered" by thinning the trees, leaving larger, fire resistant species. After construction this zone shall only be used for storing root wads and boulders in areas that are not visible from the road. The root wad and boulder storage should be fully screened by existing topography, or transplanted vegetation. Root wads and boulders can be buried under earthen berms that are designed as gentle rises in scale with other topographic variation in the area to blend with the existing natural environment. All berms shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on-site slash and fertilized to promote rapid revegetation. Transplanted trees and shrubs planted to screen storage areas shall be an average height of 15-20 feet in height. See transplanted berm diagram.

### **Zone B – Offside Topsoil and Subsoil Storage Area**

## **PCGP Forest Service Visual Management Mitigation Analysis**

This zone is an area across the pipeline trench that is utilized during construction to store topsoil and excavated soils from the pipeline trench. After construction this area shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on-site slash and fertilized to promote rapid revegetation. This zone shall have a minimum of 10 -15 transplanted trees depending on the density of trees in Zone A to immediately soften the edge of the clearing, and/or screen boulders and root wads. This zone may be used for burying boulders and root wads. See transplanted berm diagram.

### **Zone C – 30' Corridor Directly above Pipeline**

This zone is centered directly over the pipeline, and will remain open via clearing of trees greater than 15' in height, and shrubs greater than 6' in height. Within this 30' span root wads and boulders can be buried. After construction this area shall be seeded/hydro mulch with native seed mix, mulched with chips generated from on site slash and fertilized to promote rapid revegetation. Boulder and root wad groupings may be designed into this corridor. See Boulder and Root wad Grouping Diagram. A maximum of about three groupings per quarter mile shall be placed within the entire block of zones. Groupings can be used to break up the open plan of the 30' corridor.

### **Zone D – Working Zone**

This zone is between the existing road and the pipeline trench. During construction this area will receive the greatest level of equipment and truck traffic; therefore, soil compaction will be highest in this area. This area shall be wing subsoil treated to restore the soil aeration and improve the success of the restoration efforts. After construction this area shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on site slash and fertilized to promote rapid revegetation. Boulder and root wad groupings may be designed into this zone. Berms shall be designed to break up the flat plane of the construction working surface, and to bury boulders and root wads. Logs and slash shall be placed behind berm

### **Zone E – The Road Side Edge**

The road side edge is the zone that is between the construction zone, and the edge of the existing road. This zone is the equivalent of an uncleared storage area in other areas, but adjacent to the Clover Creek Road, this area shall vary in width, usage and treatment depending on the existing topography and vegetation.

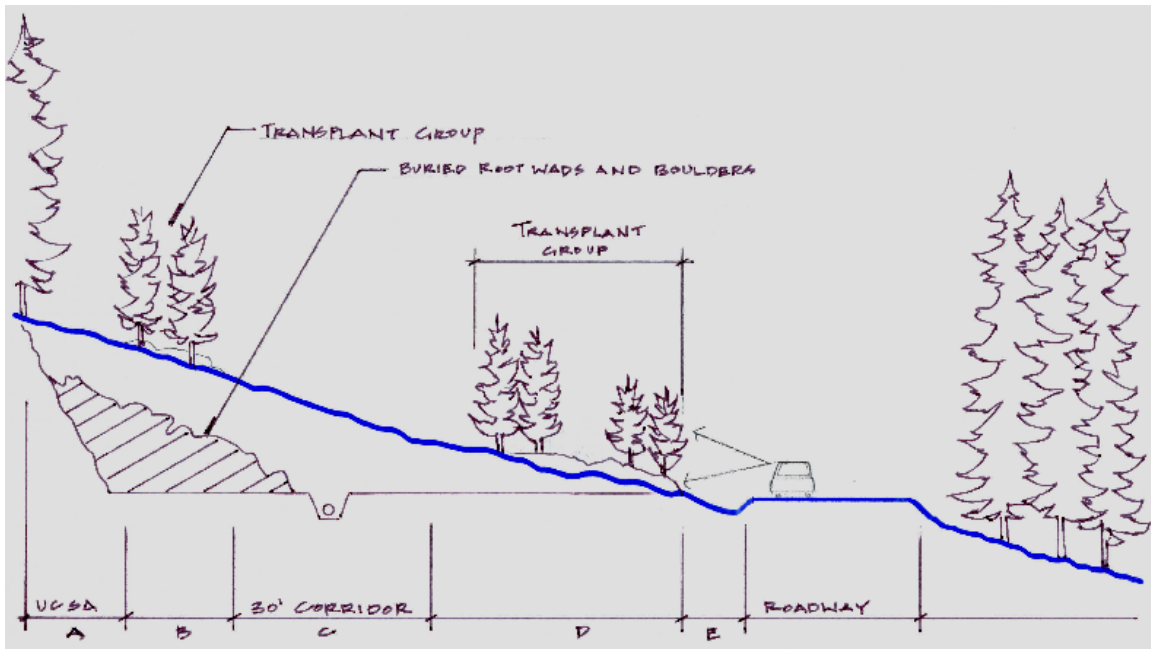
Where this zone is level, or within 5-10 feet of the roadway elevation, a minimum of 25% of the existing shrubs and trees shall be retained in clumps to provide diverse form, color and texture to the roadside edge. All areas that are impacted by construction shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on site slash and fertilized to promote rapid revegetation. There shall be no root wads, boulders or logs or slash placed in this zone.

## PCGP Forest Service Visual Management Mitigation Analysis

Where this zone is sloping downward and away from the road at 30% or greater, vegetation high enough to screen the 30' corridor opening shall be retained. Root wads and boulders can be stored at the base of the slope meets the graded construction zone surface, where retained vegetation provides screening. Where this zone is sloping upward, and away from the road at 30% or greater, retained vegetation will provide diversity in form, color and texture. It is expected that where the road route is adjacent to a cut bank along the road that is greater than 10' in height, the PCGP ROW will be pulled back away from the cut bank by 20-30 feet. All areas that are impacted by construction shall be seeded/hydro mulched with native seed mix, mulched with chips generated from on site slash and fertilized to promote rapid revegetation. There shall be no root wads, boulders or logs or slash placed in this zone.

### Template Diagrams

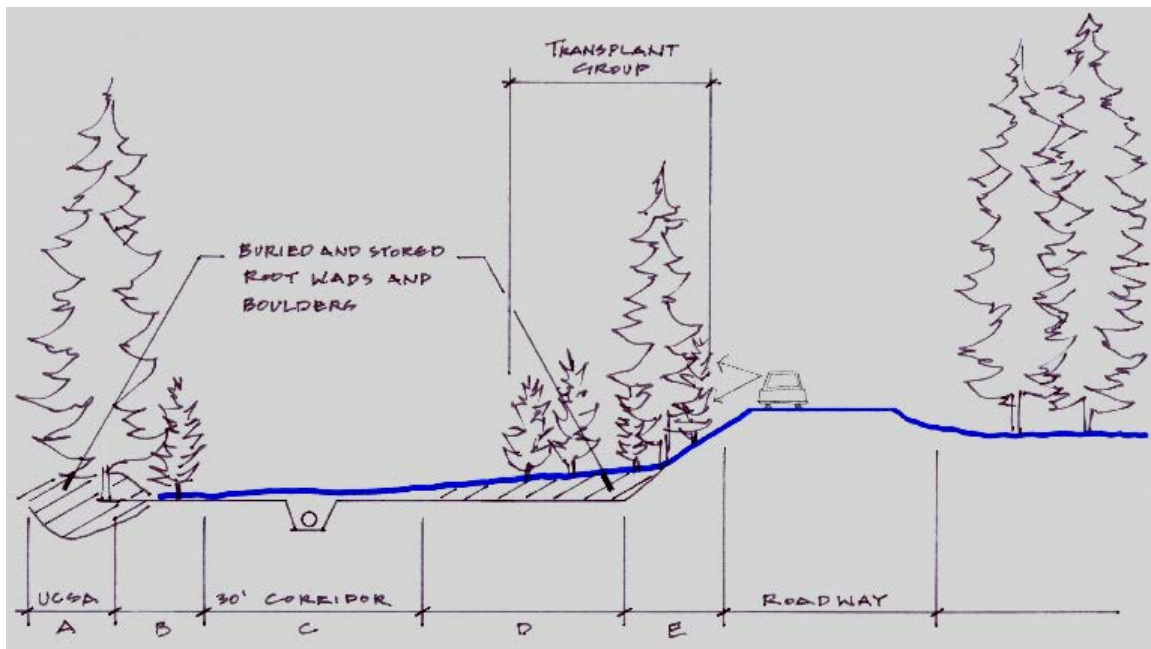
The following template diagrams specify mitigation measures to be used based on the topography. The diagrams are to be used in conjunction with the linear guidelines. The diagrams are typical templates to be used under the advisement of the Forest Service landscape architect and in coordination with Pacific Connector's EI(s) that is available on site at the time of construction.



### Diagram A –PCGP Above the Roadway

Bury root wads and boulders under the soil used to recontour the excavation zone. Construct transplant groupings as shown in the linear guideline diagram.

## PCGP Forest Service Visual Management Mitigation Analysis

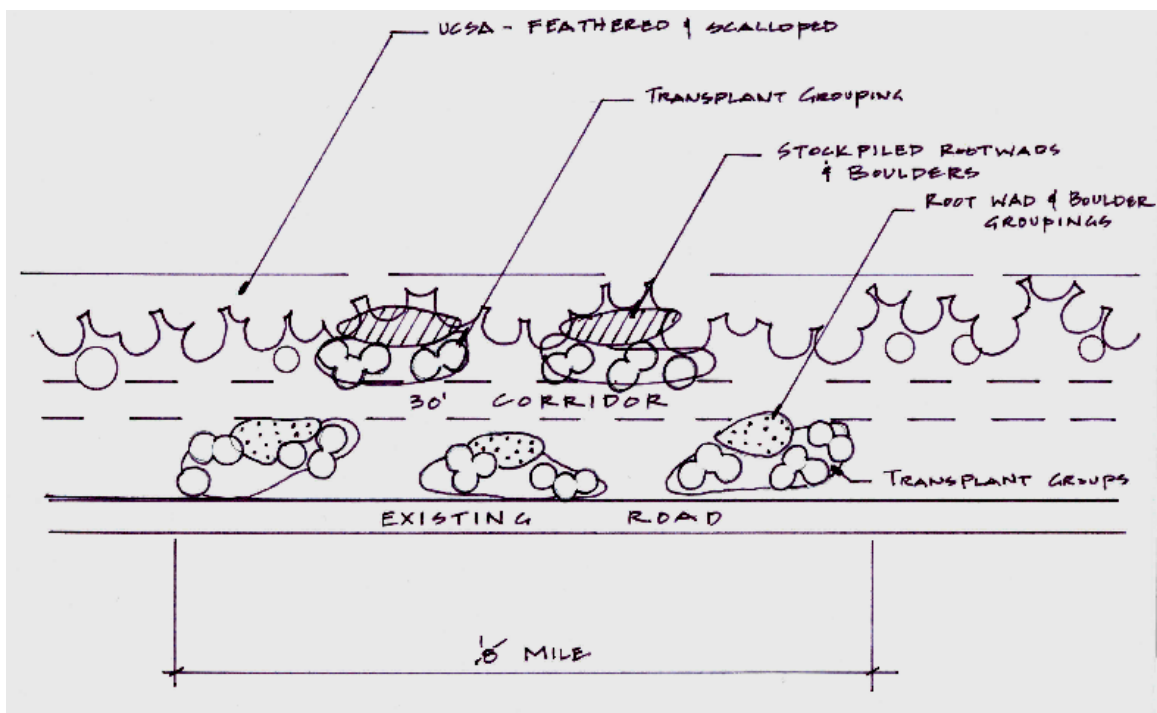


### Diagram B –PCGP is below the roadway

Bury and store root wads and boulders where screened from the view of the viewer on the Clover Creek Road. Transplant trees and shrubs in groupings to create diverse spatial patterns, and to break up the strong linear form of the retained vegetation. Retain vegetation on the bank of the roadway.



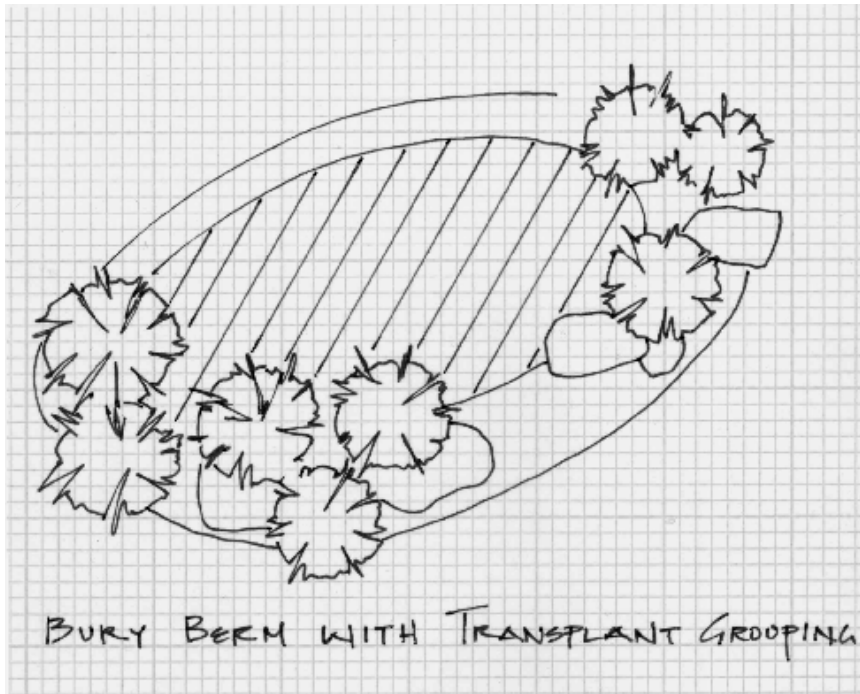
## PCGP Forest Service Visual Management Mitigation Analysis



**Diagram C – Linear Guideline Template for 1/8<sup>th</sup> Mile**

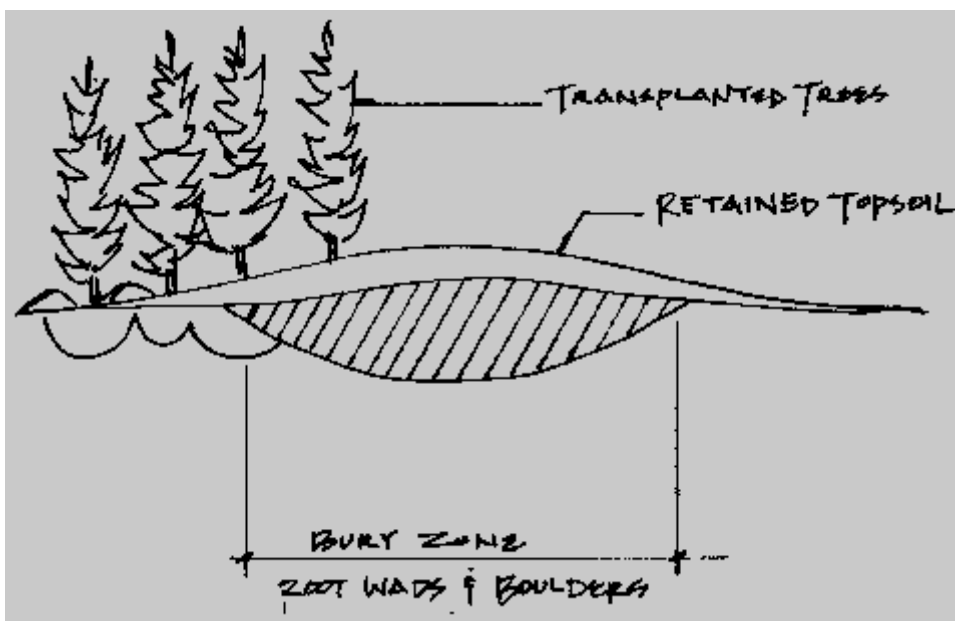
Construct root wad and boulder groupings behind transplant groups. Feather and scallop the uncleared storage areas, and stockpile root wads and boulders behind transplant groupings. Limit root wad and boulder groupings to approximately 3 per 1/8<sup>th</sup> mile.

## PCGP Forest Service Visual Management Mitigation Analysis



**Diagram D – Bury Berm with Transplant Grouping**

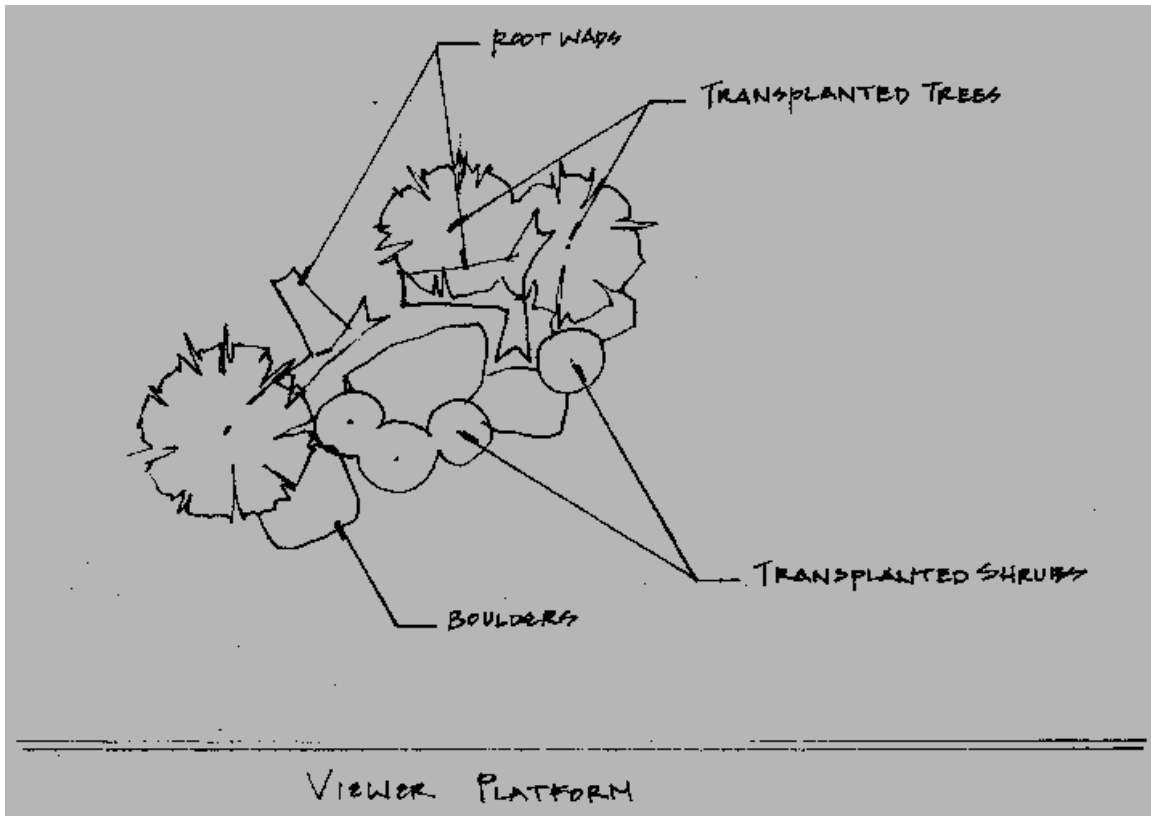
Bury root wads and boulders and construct a berm with retained topsoil. Plant the edges of the berm with transplanted trees, and place recessed boulders in the designed grouping.



**Diagram E – Bury Berm with Transplant Grouping**

Plant at edges of bury zone.

## PCGP Forest Service Visual Management Mitigation Analysis



### Diagram F – Root Wad and Boulder/Transplant Grouping

Construct groupings to vegetate the cleared ROW.

### Expected Results of Mitigation to Meet Modification VQO

The expected results are based on the above mitigations and the specific site designed mitigation by zone and topography.

The immediate foreground of the Clover Creek Road, being heavily modified by pipeline construction would undergo extensive mitigation and over a long period of time will meet modification. Treating the soils by sub soiling, chip and hydro mulching, seeding and planting shrubs and grasses will address the impacts to the forest floor. Screening and burying boulders and root wads, designed berms and transplanted tree groupings will rebuild the foreground view, although the linear 30 foot ROW will always be evident.

It is expected that it will take approximately 10 to 15 years for this to be accomplished. Under the Scenery Management System this is an acceptable time frame, however under the Visual Management System, Partial Retention must be met within the second to third year after completion of the project.

## **PCGP Forest Service Visual Management Mitigation Analysis**

### **Mitigation to Meet Partial Retention VQO**

The forest plan standard for this area is foreground partial retention. This means that impacts “remain visually subordinate to the characteristic landscape”.

The continued removal of trees over 15ft and shrubs over 6ft within the immediate foreground of the Clover Creek Rd for the extended length of approximately 18 miles (8 miles being NFS lands) would keep a 30ft corridor clear of vegetation less than 15ft in height. This is considered a linear corridor that is inconsistent with the characteristic landscape surrounding the project area. Because this strip is retained throughout the existence of the pipeline in this location, partial retention would not ever be met given the recommended mitigation measures within and along the edge of the ROW.

In order to meet partial retention, the corridor effect must be addressed. Address meaning make the corridor effect “visually subordinate”. To do this the surrounding timbered area would need to be sufficiently “opened up” to a degree that the corridor no longer appears as a contiguous linear feature, but is more like openings that are consistent with those in the surrounding characteristic landscape. This means consistent in “size, amount, intensity, direction, pattern, etc.” Any introduced form, line, color, or texture that is introduced should remain subordinate to the visual strength of the characteristic landscape.”

To do this the surrounding timbered area would need to be sufficiently “opened up” to create a pattern that is both characteristic of natural occurrences, and would blend the 30ft corridor into the modified surrounding landscape. Within the ponderosa pine type vegetation, this could be possible by designing a project that would create open stands of varying sized openings and clusters of trees. This project design would mimic a ponderosa pine stand that has frequent fire occurrences that create an “open park-like stand”, where small shrubs and grasses occur on the forest floor. This type of project is consistent with SMS in that it addresses scenic stability issues making the pine stands more resistant to large stand replacement fire. Combined with the all of the recommended mitigation measures of transplanting within the construction zone(B,C, D) and leaving trees in zone E, this approach would screen parts of the contiguous 30ft opening from the viewer while blending the opening into the newly opened up timbered area, making the impacts visually subordinate to the characteristic landscape.

If this type of approach was included in the chosen alternative, then partial retention could be met as soon as soil color contrast mitigation was successful, and transplanted trees within the 75' corridor reached 20ft in height. The transplanted tree density would need to mimic the modified basal area of the surrounding area to blend the corridor into the landscape. Partial retention would not be met within the first year, but could eventually be met.

## **PCGP Forest Service Visual Management Mitigation Analysis**

These types of approaches were not addressed in the initial analysis, because it was considered beyond the limits of the project boundary. Whether that was an appropriate reason may be questionable but none the less it is why it was not included.

To be sure of achieving the required VQO, it is important to include measures such as:

- Replacement of trees that do not survive transplant
- Replacement of browsed shrubs
- Tilling, reseeding and mulching of areas where grasses do not take root

The survival rate of all transplanted and seeded plantings needs to be sufficient to meet the objectives of the mitigation. A survival rate of 70 percent should be achieved at the 5 year mark to ensure the success of the mitigations.

It is also important to use design features that address the larger project work, such as low cut stumps, slash treatment, skid trail treatments, etc. to ensure that these proposed methods do not compound the initial visual impacts.

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## **Appendix R-10**

### **BLM Letter to FERC regarding Project Impacts on Wild and Scenic River Resources**

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# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Oregon State Office  
P.O. Box 2965, Portland, Oregon 97208  
<http://www.blm.gov/or>



**SEP 03 2015**

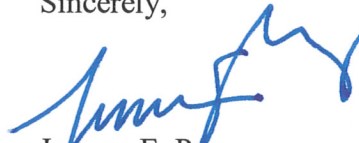
Mr. Paul Friedman  
Federal Energy Regulatory  
Commission  
Office of Energy Projects  
888 First Street, NE  
Washington, DC 20426

Dear Mr. Friedman:

Specialists from the Medford and Lakeview Districts have reviewed the Rogue River and Klamath River crossings of the proposed Pacific Connector LNG pipeline and have determined that there would be no impact or effect to the Wild and Scenic River resources of these two designated rivers.

Specifically, because the pipeline would be installed under the rivers using horizontal directional drills, there is no potential to affect the free-flowing character or classification or recreation, fish, or wildlife values present within the Rogue Wild and Scenic River corridor near Grants Pass, Oregon, and the Klamath Wild and Scenic River corridor near Klamath Falls, Oregon. Therefore, a Section 7 determination is not required.

Sincerely,



Jerome E. Perez  
State Director  
Oregon/Washington

cc:  
Jon Raby  
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**Appendix R-11**  
**Recreation Management Plan**

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**Pacific Connector Gas Pipeline, LP**

## **Recreation Management Plan**

### **Pacific Connector Gas Pipeline Project**

**As of May 19, 2012, the BLM, Forest Service, and Reclamation submitted documentation to Pacific Connector that this plan was complete. Since then, changes have been limited to updating the project description/facilities and mileposts. Yellow highlights represent language that may/will be updated throughout the FERC process.**

**January 2013**

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## 1.0 INTRODUCTION

The public lands and waters crossed by the Pacific Connector Gas Pipeline (PCGP) Project provide users with many opportunities for group and individualized forms of recreation. These include, but are not limited to, harvesting non-timber forest products, sightseeing, hunting, fishing, camping, cross-country skiing, mountain biking, snowmobiling and off-highway vehicle (OHV) use. Where the PCGP Project is located on federal lands managed by the USDA Forest Service (Forest Service) and USDI Bureau of Land Management (BLM), Pacific Connector recognizes the importance of maintaining safe access to outdoor recreation areas. In some cases, controlling access to the right-of-way to facilitate restoration activities and prevent damage to other resources is also a major concern. In addition, Haynes Inlet of the Coos Bay Estuary, crossed by the PCGP Project, supports boating and other water-related recreation. To aid in maintaining recreation opportunities, limiting right-of-way access, and preventing user conflict on public lands and in the waterway within the PCGP Project area, Pacific Connector has prepared this Recreation Management Plan (Plan).

### 1.1 Purpose

The purpose of the Plan is to assist in the management of existing recreation resources on lands within or impacted by the PCGP Project area. This Plan establishes goals for managing recreation in the vicinity of the PCGP Project and describes actions to provide continued safe access, prevent resource damage, and to avoid potential user conflict.

### 1.2 Goals

- Goal 1: Provide for Safe and Continual Access to the Pacific Crest National Scenic Trail throughout the construction and revegetation phases, to the extent practicable.
- Goal 2: Minimize Potential User Conflicts at Trail Intersections used by hikers, skiers, snowmobilers, OHVs, and others.
- Goal 3: Prevent Unauthorized OHV Use on federal land where the PCGP Project right-of-way could create additional access points.
- Goal 4: Provide Boaters and Anglers Safe Access within the Coos Bay Estuary, specifically in the area of Haynes Inlet.
- Goal 5: Minimize Recreation Access Disruption on public lands.

## 2.0 RECREATION IMPACTS

The impacts on a particular recreational activity and specific public land or waterway will depend on the timing of construction and the recreational activity. However, the various forms of recreation typically practiced in the PCGP Project area will not be permanently impacted by construction and operation of the pipeline. During construction, there would be temporary land and water access restrictions to recreationists for safety reasons on the construction right-of-way. Because construction and restoration along the proposed pipeline alignment will span a period of two years, there may be areas that remain off limits to recreationists until restoration is complete, revegetation has established, and the construction right-of-way is stabilized.



Temporary access restrictions would be dealt with on a case-by-case basis and in consultation with agency recreation specialists and user groups.

Extended periods of solitude or peaceful off-road camping, hiking or sightseeing in dispersed recreation sites (i.e., Peavine Camp, Project Camp, Brown Mountain Shelter, or make-shift RV camps) within the vicinity of pipeline construction could be temporarily disrupted by the noise and dust from heavy equipment use and traffic. Appendix B of the Plan of Development (POD) provides Pacific Connector's Air, Noise and Fugitive Dust Control Plan that describes the BMPs that would be utilized to control noise emissions and fugitive dust in more detail. Table 2-1 provides the major recreation areas in the PCGP Project area.

**Table 2-1**  
**Major Recreation Areas in the PCGP Project Area**

<b>Milepost</b>	<b>Recreation Site/Area</b>	<b>Recreation Type</b>	<b>Agency <sup>1</sup></b>	<b>Direct Impacts</b>
1.47R-1.70	Oregon Dunes National Rec. Area	Hiking, OHVs, Sightseeing	FS-S	No
1.70R-4.10R	Coos Bay Estuary	Boating, Fishing, Boat Launch	ODFW, OPRD	Yes
167.86	Pacific Crest National Scenic Trail	Skiing, Hiking, Horses	FS-RRS	Yes
158.50-168.90	Brown Mountain Trail Network	Snowmobiles, Skiing, OHVs, Hiking, Horses	FS-RRS, FW	Yes
<sup>1</sup> FS=Forest Service; S=Siuslaw; ODFW=Oregon Dept. of Fish and Wildlife; OPRD=Oregon Parks and Recreation Dept; RRS=Rogue River-Siskiyou; FW=Fremont-Winema				

Forest Service and BLM access roads will experience short-term traffic increases during construction, and some roads may be temporarily closed to ensure safe transport of construction equipment to and from the construction right-of-way, as well as to facilitate construction in areas where the pipeline is aligned within existing roads. As outlined in Section 3.1 (Notifications) of the Transportation Management Plan (see Appendix Y of the POD), Pacific Connector will ensure that construction schedules are communicated to minimize potential access impacts.

During pipeline operations, the cleared pipeline right-of-way could be utilized by recreational users, including hikers, equestrians, skiers, and mountain bikers, especially where the corridor crosses existing roads and is easily visible and accessible. Although motorized travel would be discouraged and prevented by barricades suited to the particular area, other users may access the corridor and utilize it to connect with roads and trails. In higher elevations during the winter months, the pipeline corridor may be used by cross country skiers and possibly snowmobilers, depending on the effectiveness of the barricades and the preferences of the land owner/manager. Pacific Connector is inclined to allow incidental use of the right-of-way as long as it does not result in resource damage, erosion, and/or conflict with land owner/manager preferences.

Pacific Connector will make every effort to notify the agency(ies) at least seven (7) days in advance of road and trail closures. District recreation managers from both the Forest Service and BLM will be contacted, as necessary. In some instances, unforeseen schedule changes may limit the seven-day notice goal; in such cases, a minimum 48-hour notice will be provided. Mitigation measures are detailed in Section 3.0 below.

## 2.1 Recreation Areas

Haynes Inlet and Coos Bay Estuary. Clamming, crabbing, and fishing are common year-round recreation activities in Coos Bay. Canoeing, kayaking, and boating are also common in the sloughs, feeder streams, and tidal waters of the bay.

The Coos Regional Trails Partnership, a consortium of land management agencies and economic development groups developed a brochure that maps Coos Bay's water trails for kayakers and other paddlers. Portions of two water trails are in proximity to the proposed pipeline alignment. The North Slough Trail begins at the west end of the North Spit Causeway, about 0.3 mile north of where the proposed pipeline would enter Haynes Inlet, and follows the North Slough northward. The proposed pipeline would not cross this water trail. The Haynes Inlet Trail begins at the boat launch at the Conde B. McCullough State Wayside, about 0.4 mile south of where the pipeline would leave Haynes Inlet, and heads northeast. The pipeline would cross the Haynes Inlet Trail at about pipeline MP 3.9. During active pipeline construction, users of the Haynes Inlet Trail, or other boaters using the main channel of the inlet near the boat ramp, could be restricted from passage up the channel due to pipeline construction activities. The Conde B. McCullough State Wayside and associated boat launch is maintained by the Oregon Parks and Recreation Department (OPRD).

There is also a popular fall Chinook salmon fishery throughout the southern portion of Coos Bay. Anglers fish from late August through late October and would not be affected by Project activities because the alignment has been routed away from this area and the Coos River would be crossed using a Horizontal Directional Drill.

Pacific Crest National Scenic Trail. The PCGP Project crosses the Pacific Crest National Scenic Trail (PCT) at approximately MP 167.86. This section of the trail is used year round by hikers, equestrian users, cross-country skiers, and snow-shoers. The PCT users could be temporarily impacted by pipeline construction and might experience short-term (potentially 48 hours or less) delays and/or temporary detours at the trail-pipeline intersection.

Off-Highway Vehicles and Right-of-Way Access. The pipeline right-of-way could increase unauthorized OHV, snowmobile, and dispersed motorized access and its associated potential resource impacts. Locations where unauthorized access could be exacerbated by the pipeline corridor include: the area around the PCT near MPs 167.0-169.0; the Camel Hump area between MPs 123 and 128; the Obenchain area between MPs 132 and 137.2; and along the Clover Creek Road between MPs 168.9 and 175.4 (on Forest Service-administered land), 176.2 to 177, and 179.6 to 179.7 (on BLM lands). In the Obenchain area, four-wheel drive vehicles have caused extensive resource damage, and there is concern that the pipeline corridor might create opportunities for more access and impacts. The Camel Hump and Obenchain areas are located within the Jackson Access and Cooperative Travel Management Area, which encompasses both private and BLM lands, and is generally closed to motorized use from mid-October through April. Because the pipeline will closely parallel Clover Creek Road for 18 miles on public and private lands, the pipeline corridor clearing could potentially turn into an OHV thoroughfare without appropriate barriers and mitigation.

Brown Mountain Multi-Use Trails. In addition to summer recreation, the PCT and surrounding/connecting trails form a popular cross-country ski trail system when covered with snow. Snowmobile use is also a popular winter activity in the area around approximate MPs 160.0-170.0. Due in part to a new housing development at Clover Creek Road, land managers have noted that snowmobile users have been accessing and crossing the PCT between Dead

Indian Memorial Road and Forest Road (FR) 700. The PCGP Project could potentially intensify this problem without appropriate mitigation.

Lake of the Woods. This popular lake in the Fremont-Winema National Forest is host to fishing, camping, and various forms of boating and water-based recreation during summer months. A private resort and marina on the lake provides seasonal lodging and food service. During the winter, cross country skiing and snowmobiling are common activities in the area. Lake of the Woods is a potential source for water used in the Project's hydrostatic testing requirements. The proposed withdrawal would likely occur in late summer/fall. No road or recreation facility closures are anticipated for water withdrawals and transport. The water would be withdrawn from the east side of the lake near the Sunset Campground and boat launch, and transported using the Forest Service Road FS 3700240 and Dead Indian Road. (see Drawing 3430.31-Y-025A of the Transportation Management Plan included as Appendix Y of the POD). As noted in Section 3.1, once Pacific Connector has selected a Contractor for the Project, and the Contractor has assessed the water withdrawal requirements, the Contractor will work through Pacific Connector to submit a water withdrawal plan to the Forest Service to minimize recreational user impacts and encumbrances at the lake.

Fish Lake. Located on the Rogue River-Siskiyou National Forest near the crest of the Cascades, this scenic lake provides year-round recreational opportunities. The Fish Lake Recreation area provides Forest Service campgrounds, picnic areas, boat-launching ramp as well as a privately-operated resort with cabins, a trailer park, additional camp sites, food service, and a marina. During the winter, ice fishing, cross-country skiing and snowmobiling are common activities in the area. Fish Lake is a potential source for water used in for the Project's hydrostatic testing requirements. The proposed withdrawal would likely occur in late summer/fall. No road or recreation facility closures are anticipated for water withdrawals and transport. The water would be potentially withdrawn from two locations; with one location located at the lower end of the lake near the dam and the second at the upper end of the lake near Fish Lake Campground and the boat ramp. Water would be transported using Forest Service Roads 2800700 and 2800705 for access near the Dam and Forest Service Road 2800800 for access near the Campground (see Drawing 3430.31-Y-024B of the Transportation Management Plan included as Appendix Y of the POD). As noted in Section 3.1, once Pacific Connector has selected a Contractor for the Project, and the Contractor has assessed the water withdrawal requirements, the Contractor will work through Pacific Connector to submit a water withdrawal plan to the Forest Service to minimize recreational user impacts and encumbrances at the lake.

### **3.0 MITIGATION**

Generally, recreation mitigation on federal lands will be ongoing through all phases of construction and will consist of multi-use trail barriers, signage, agency and user group consultation, and adaptive construction techniques. Detours will be established for trails, if necessary, and Pacific Connector will coordinate with the appropriate agencies to minimize construction-related impacts. If unanticipated recreational impacts occur during construction or operations, the appropriate land managing agency will notify and request that Pacific Connector address/mitigate the impact. Construction near these areas will be short-term in nature. Following construction, all disturbed areas will be restored to pre-construction contours and recreational activities will continue unimpeded. Where practical, Pacific Connector will design recreation resource mitigation measures in ways that do not conflict with the area's visual resources. Pipeline operation activities will not be noticeable to recreationists, except in periodic cases of inspection and maintenance during the life of the pipeline.

Where necessary during construction in areas of recreational use, Pacific Connector will water roads and areas of active construction where site-specific conditions require dust suppression to minimize potential impacts associated with fugitive dust. Watering for fugitive dust abatement will be directed by Pacific Connector's Environmental Inspectors (EIs) and will take into account recommendations and concerns raised by the federally-authorized representative on federally-managed land. The water for dust control will be acquired from an approved source. The Air, Noise and Fugitive Dust Control Plan (Appendix B of the POD) describes the Best Management Practices that will be employed to minimize fugitive dust (see Section 2.2). Overall, construction-related impacts to recreation will be minimized by:

- Not allowing construction workers to camp on federal lands;
- Continued coordination with each affected land management agency, as necessary, to finalize site-specific mitigation measures to address recreational land impacts; and
- Effective post-construction reclamation of the construction right-of-way as outlined in the Erosion Control and Revegetation Plan (ECRP) (see Appendix I of the POD).

After construction, pipeline monitoring methods will be conducted, which will benefit vegetation restoration and discourage vehicle access. Specifically, where necessary, steep portions of the pipeline corridor should be posted closed to all vehicles. Successful revegetation efforts and the absence of vehicle tracks on these areas will help discourage unauthorized vehicle use by not attracting attention to "hill climbs." Monitoring-related impacts to recreation will be minimized by:

- Conducting inspections of pipeline sections on foot instead of by vehicle, where steep pipeline corridor sections are visible from nearby roads.
- Conduct vehicle monitoring only during dry conditions.

Descriptions of specific mitigation measures are detailed below. These measures are subject to change and could be expanded, substituted, or abandoned as a result of ongoing consultations with agency recreation specialists.

### **3.1 Specific Mitigation for Recreation Sites/Types**

Haynes Inlet and Coos Bay Estuary. In an effort to avoid potential conflicts with the various water-based recreation opportunities in the Coos Bay estuary, Pacific Connector has developed the following specific measures to minimize impacts on recreationists using Coos Bay, specifically Haynes Inlet:

- Pacific Connector will coordinate with local municipal governments, Oregon Department of Fish and Wildlife (ODFW), OPRD, area recreation groups and consortiums like the Coos Regional Trails Partnership to provide a schedule of the Project's in-bay activities. The schedule will be updated regularly so that recreationists are aware of the Project and the location of on-going Project activities.
- Signs would be posted at the Conde B. McCullough boat launch and others around the bay to ensure boaters and kayakers are aware of the Project's location and schedule. The posted signs would include a precautionary safety warning to avoid travel in proximity to the Project's construction activities.
- Pacific Connector would also coordinate the Project schedule and construction activities directly with the Coos County Sheriff's Department and Marine Patrol, the OPRD, and the ODFW.

- In the event boaters or boat traffic are not observing safety precautions in proximity to the Project's construction activities within the estuary, Pacific Connector would contact the Sheriff to ensure public safety.

Additionally, Clausen Oysters, the largest oyster producer in the state of Oregon, is located adjacent to the McCullough boat launch in Haynes Inlet. The outfit often uses the boat launch and surrounding area for staging and moving boats and equipment. In conjunction with the measures described above, Pacific Connector will consult with representatives of Clausen Oysters regarding measures that would be implemented during pipeline construction to avoid adverse effects to the company's operations.

Pacific Crest National Scenic Trail Crossing. To minimize impacts to trail users, Pacific Connector has necked down the construction right-of-way from 95 feet to 75 feet in width for a distance of more than 100 feet on both sides of the trail. Additionally, at the request of the Forest Service, the alignment in the PCT area was designed with a "dog leg" to avoid a perpendicular crossing of the trail, thereby reducing visibility of the pipeline corridor for users. Construction of the trail crossing will also be completed as a "tie-in" so that trenching, pipe stringing, and installation activities do not interrupt trail users for extended periods. It is expected that construction of the trail tie-in would be completed within 48 hours or less to minimize potential impacts to trail users and reduce the need for trail detours. Additionally, Pacific Connector will implement the following:

- Establish a roughed-in trail tread within 24 hours of construction crossing completion with temporary directional signs posted at each end of the crossing.
- Remediate trail to full design standards within two weeks (weather permitting) of the trail crossing construction.
- Install standard Nordic ski trail markers as needed post-construction.
- Provide as much advance notice as possible to the Forest Service District Ranger and the Pacific Crest Trail Association (PCTA) as to the estimated construction dates in the area of the trail.
- Notify the Forest Service District Ranger 48 hours in advance if any anticipated delays for PCT users would exceed one hour.
- Provide at least 7 days advance notice if the PCT needs to be detoured.
- Obtain Forest Service approval and install detailed signage for detour routes.
- Plan, if practicable, for PCT disruption outside of the trail's busiest hiking season (mid-July to early August).
- Use a combination of rocks, logs, slash, and gates to deter motorized vehicles and OHVs from gaining access to the PCT, in such a manner as to not adversely impact the area's visual resource qualities, to the extent practicable.

Upon completion of construction in the area, Pacific Connector will revegetate the construction right-of-way using native trees, shrubs, and plants. Section 3.0 of the Aesthetics Management Plan – (Appendix A of the POD) describes additional measures to be used on Federal lands for

protecting and mitigating for visual resources. Pacific Connector will coordinate with the Forest Service and the Pacific Crest Trail Association regarding the need for and location of trail detours.

Off-Highway Vehicle Control and Right-of-Way Access. Pacific Connector prefers to limit OHV use on the right-of-way in order to avoid problems with revegetation efforts, prevent potential erosion, avert user conflicts, and because it is typically the preference of the landowner. To minimize OHV access on the right-of-way, Pacific Connector will install barriers at appropriate locations in coordination with the land management agencies or landowner. The proposed OHV barriers will be designed and constructed in a manner that attempts to prevent unauthorized motor vehicle/OHV use of and along the PCGP right-of-way. It has been Pacific Connector's experience that unauthorized OHV trespass can be difficult to control in some heavy OHV use areas.

The need for OHV control measures will be assessed primarily where the pipeline right-of-way intersects roads, OHV trails, or other trails. These areas will be identified by the EI and/or authorized agency representative. Pacific Connector will consult with the land management agencies for review and approval of site-specific designs for OHV control. All designs will meet agency standards, and, where applicable, will not conflict with visual resource management objectives or impact the area's visual resources.

To deter potential user conflicts and resource damage caused by unauthorized OHV use (including snowmobiles), Pacific Connector will provide various natural and constructed control measures at select intersections of the right-of-way with road and trail crossings. These would include, but are not limited to the PCT area, the Camel Back, and Obenchain Road areas, Dead Indian Memorial Highway, FR 700, and along the Clover Creek Road. Where feasible, and depending on the site-specific conditions at the area of concern and management agency/landowner preferences, one or more of the following items may be used to control OHV access (see Figures 1 and 3 in Attachment 1 for typical diagrams of OHV control measures):

- Dirt/rock berms placed across the right-of-way, sometimes coupling as part of erosion control measures;
- Non-merchantable logs, slash and/or stumps strategically placed along the construction right-of-way as prohibitive barriers (see Figure 1);
- Large rocks and boulders partially buried along the right-of-way and at road crossings to block access but also positioned in such a manner as to not form an attractive OHV "obstacle course" (see Figure 1);
- At the request of the BLM and Forest Service, trench/earthen barriers would not be installed on federal lands. These types of barriers (see Figure 2) may be utilized on private lands at the direction of or where approved by the landowner.
- Signs (see Figures 3) and/or locked gates and fencing;
- Additional signing and gating needs within the Jackson Access and Cooperative Travel Management Area will be coordinated with the Oregon Department of Fish and Wildlife.



- Vegetative screens planted or transplanted to block and/or disguise the right-of-way;
- Salvaged woody debris (slash) scattered across the right-of-way to discourage OHV use;
- OHV barriers in sensitive viewsheds will be developed and installed in accordance with guidelines found in Pacific Connector's Aesthetics Management Plan (see Appendix A of the POD); and/or
- Where necessary, OHV control structures would extend out beyond the right-of-way to prevent drive-around and would be built at an appropriate height to prevent passage.

Additionally, Pacific Connector will establish a line of communication between the federal management agencies and landowners in the vicinity of Clover Creek Road, Dead Indian Memorial Highway, and FR 3720 in order to help prevent current and potential future snowmobile and OHV use on non-motorized trails in the area.

Pacific Connector will coordinate with each affected land management agency during construction and restoration to finalize site-specific OHV control measures. Following construction, the effectiveness of the site-specific measures will be assessed in consultation with the land management agencies, on a periodic basis. Generally, these assessments will be made in conjunction with revegetation monitoring and in response to identified problem areas. Adjustments will be made to OHV control measures as indicated by such assessments. Pacific Connector will be responsible for monitoring and managing unauthorized OHV use during the life of the Project; will implement additional measures as necessary; and will continue to coordinate with federal land management agencies during pipeline operations to ensure deterrence of unauthorized OHV use on the right-of-way.

Brown Mountain Multi-Use Trails. To help prevent potential user conflict, Pacific Connector will provide OHV and snowmobile control measures, to the extent practicable and safe, at key right-of-way road and trail crossings as described above. These include the Dead Indian Memorial Highway, FR 700, and other appropriate locations. Pacific Connector will engage in ongoing consultation and monitoring with local recreation groups and land managers during the construction phases and, if necessary, following construction to assess and modify the mitigation.

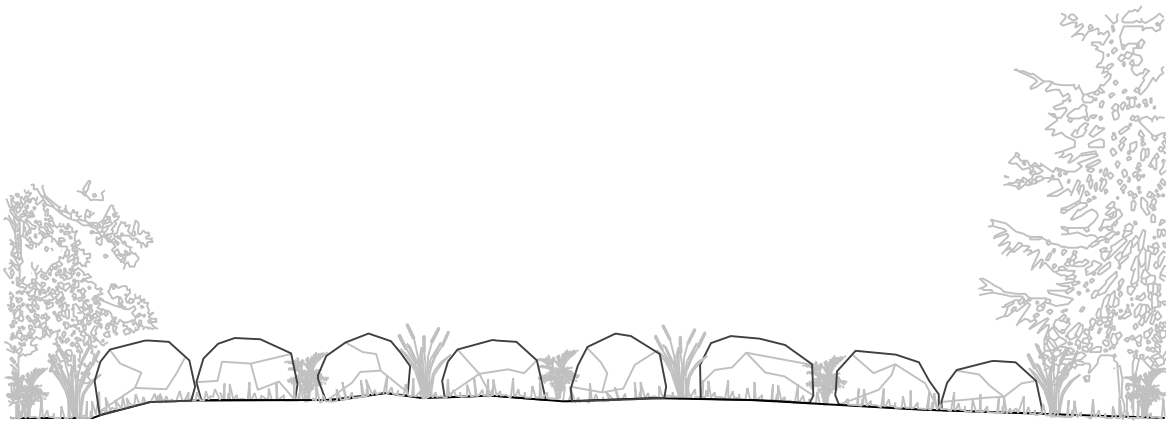
Lake of the Woods and Fish Lake Hydrostatic Test Water Withdrawals. Lake of the Woods and Fish Lake are potential sources of water for use in the Project's hydrostatic testing requirements. The proposed withdrawals would likely occur in late summer/fall. Although no roads or recreation facility closures are anticipated for water withdrawals and transport, potential impacts to the lakes' recreational users could occur from these Project activities, if not properly planned. Therefore, once Pacific Connector has selected a Contractor for the Project, and the Contractor has assessed the water withdrawal requirements, the Contractor will work through Pacific Connector to submit a water withdrawal plan to the Forest Service to minimize potential recreational user impacts and encumbrances at these lakes. The plan will address operational requirements, workspace requirements, schedule of operations, and Best Management Practices to ensure environmental protection and measures to minimize potential impacts to the lakes' recreational users.

## **Attachment 1 Figures**

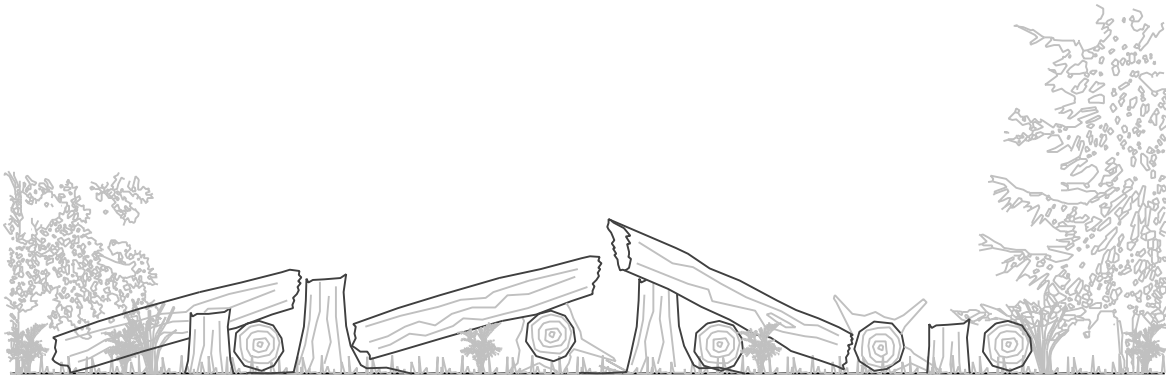
Figure 1 – Typical Rock/Slash OHV Barriers

Figure 2 – Typical Earthen Barrier Specifications

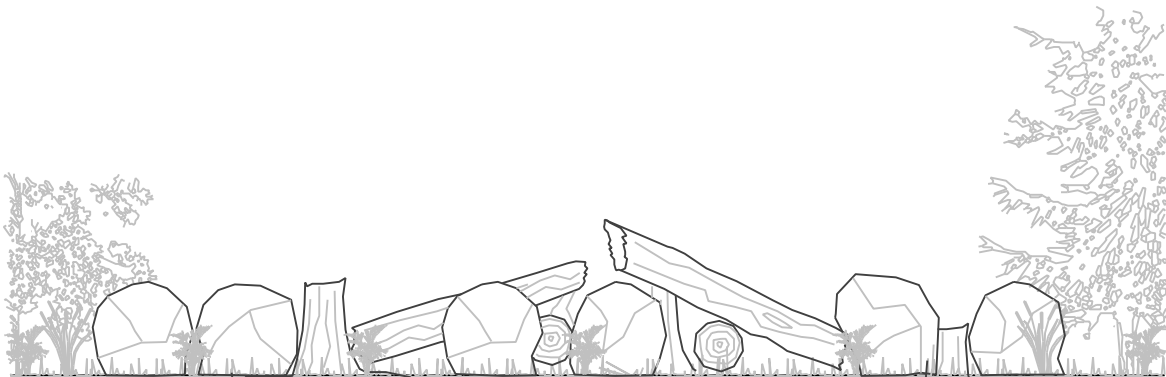
Figure 3 – Examples of Signs that Could Be Posted to Discourage OHV Traffic on the  
Construction Right-of-Way



**OHV ROCK BARRIER**



**OHV SLASH BARRIER**

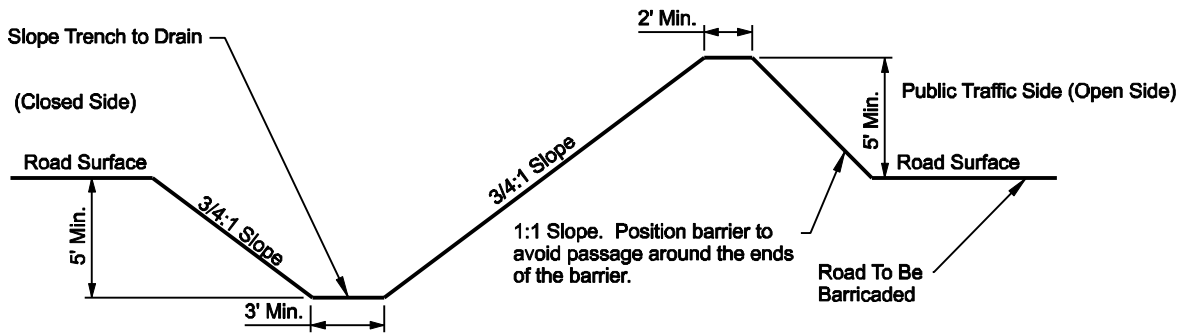


**OHV ROCK / SLASH BARRIER**

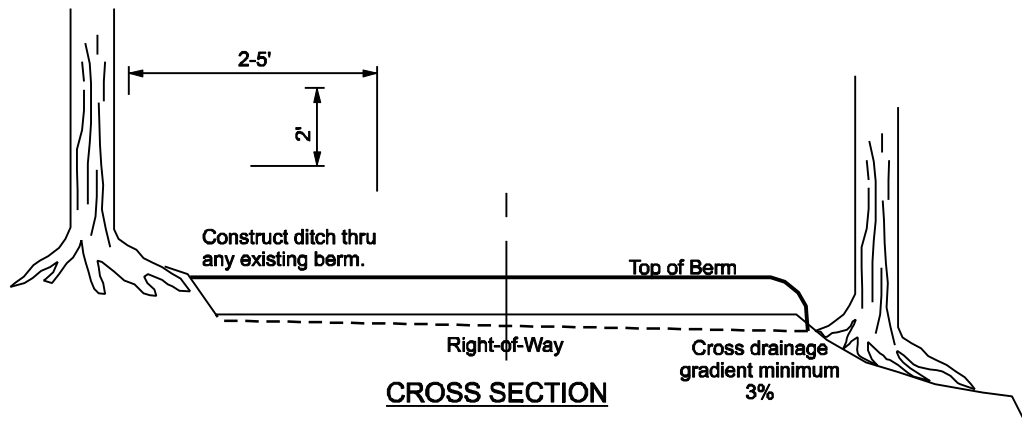
**NOTES:**

1. Large rocks/boulders used to deter OHV traffic will be approximately 3 feet in diameter, partially buried and spaced to prevent OHV traffic including motorcycle use.
2. Slash, including stumps, logs and tree tops may be appropriate piled and stacked to create an effective OHV deterrence across the right-of-way at road intersections, trails and other appropriate locations.
3. Multiple methods and types of OHV barriers may be used to prevent/discourage OHV traffic.
4. Ensure OHV deterrence by extending barriers to existing vegetation or other natural barriers to discourage OHV traffic from accessing the pipeline corridor. Barriers may need to extend outside of the pipeline ROW in order to be effective.
5. Unnatural rows of barriers should be avoided. Barricade material should be more heavily concentrated directly adjacent to potential access points, roads trails and parking areas then decrease in density further away from the access point.

**FIGURE 1  
TYPICAL ROCK/SLASH OHV BARRIERS**



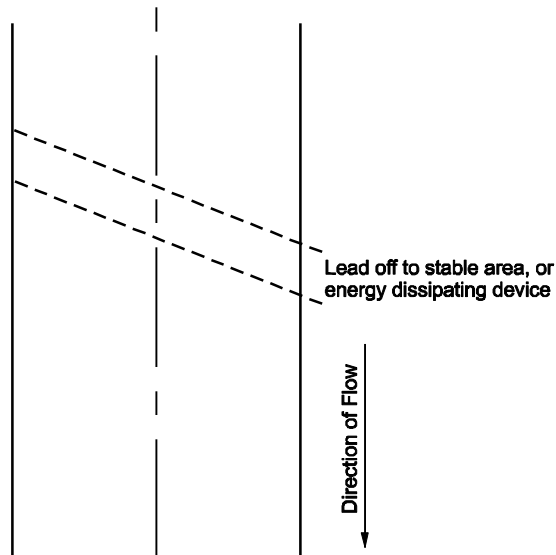
PROFILE



CROSS SECTION

**NOTES:**

1. Barriers should be sloped to drain with a relief ditch through the down slope edge of the right-of-way. The trench shall be behind the berm for approaching traffic.
2. Tie-in to existing vegetation or other natural barrier when feasible. Use large rocks/boulders, stumps or slash where barriers are not present to control OHV traffic from bypassing trap.
3. On private lands the structure locations will be approved by the landowner. These structures are not approved for use on federal lands.
4. Trench depth to be determined by PCGP when paced across the right-of-way to ensure pipeline protection.



PLAN VIEW

**FIGURE 2**  
**TYPICAL TRENCH/EARTHEN BERM BARRIER SPECIFICATIONS**  
(Not to be used on federal lands)

**Figure 3**  
**Examples of Signs<sup>1</sup> that Could Be Posted**  
**to Discourage OHV & Snowmobile Traffic on the Construction Right-of-Way**



<sup>1</sup> <http://www.benmeadows.com/>